

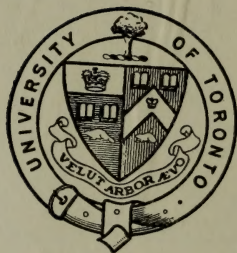


REPORT OF THE
**Hydro-Electric Power
Commission**
OF ONTARIO
1919
VOL. III.

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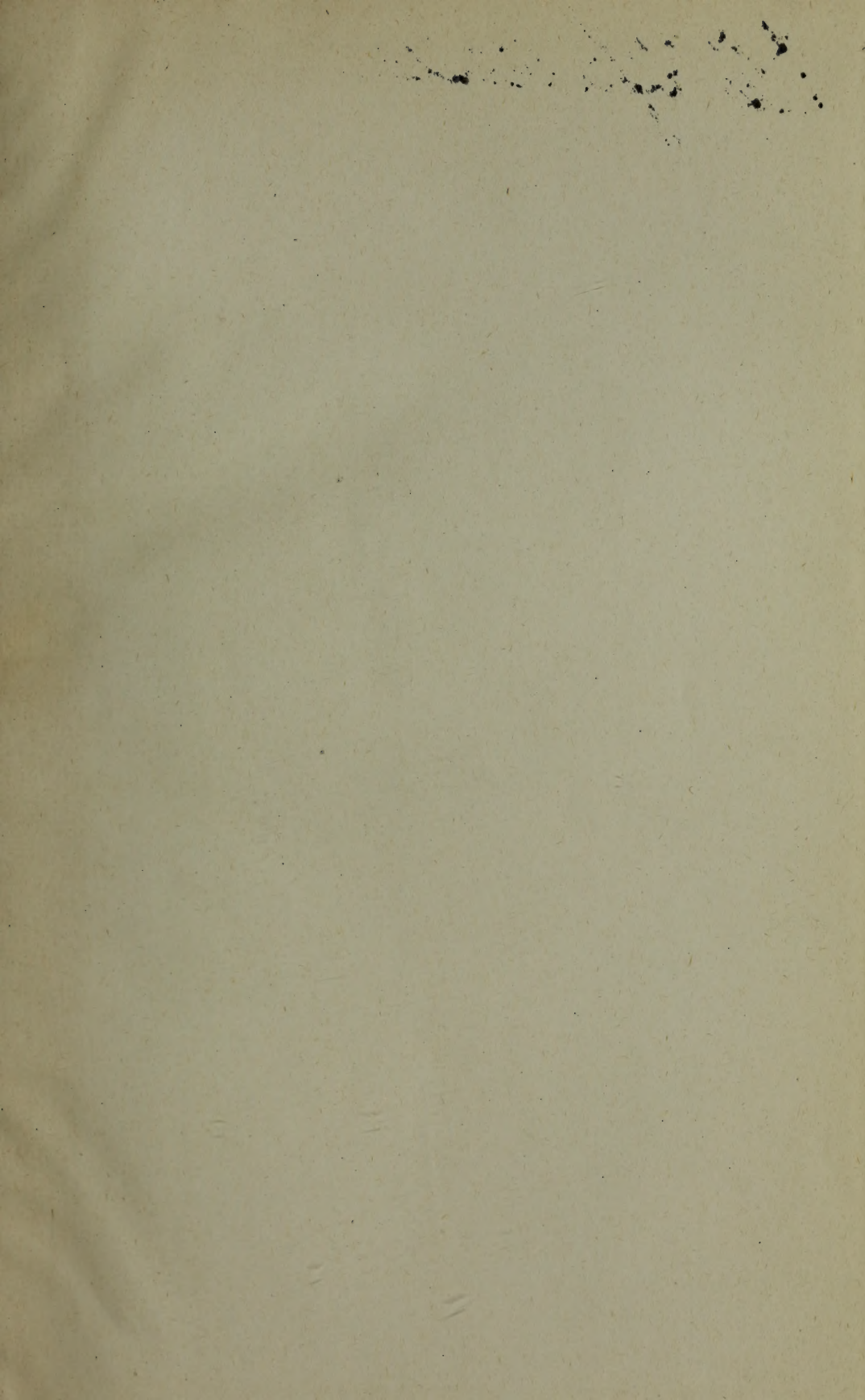
WILLS MACLACHLAN, Esq.

W. M. Maclachlan



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The Chippawa-Queenston Power Development.

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Ontario Hydro Electric
Power Commission
(Twelfth) Annual Report

OF THE

HYDRO-ELECTRIC POWER COMMISSION

OF THE

PROVINCE OF ONTARIO

FOR THE YEAR ENDED OCTOBER 31st

1919

VOLUME III

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



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1920

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UNIVERSITY OF TORONTO

To His Honour THE HONOURABLE LIONEL H. CLARKE,
Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present to your Honour Volume III of the Twelfth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1919.

The Commission in submitting its Annual Report for the fiscal year does so with a measure of pride in the extremely satisfactory results of the operations of a year which has been pregnant with difficulties, due to the period of readjustment succeeding the successful conclusion of the World War in November, 1918.

The year has been fraught with many difficulties, having commenced as it did at the most critical period in the great conflict when every effort was being made by the Commission to supply the enormous demands for power in all districts for the manufacture of munitions. The signing of the Armistice came shortly after the beginning of the year, and still more obstacles were encountered during the readjustment period, when the industries throughout the Province were returning to commercial lines, during which time the loads on many systems were reduced to such an extent as to seriously decrease the revenues and consequently to embarrass the financial operations of the municipalities on these systems.

At the time of the signing of the Armistice, the Commission was supplying power in the various parts of the Province to over 400 plants working on the manufacture of munitions and war supplies. These plants were at that time using approximately 70 per cent. of the total amount of power supplied by the Commission on all systems. Immediately after the Armistice was signed most of these plants were temporarily idle until such time as their machinery, equipment and organizations could be readjusted to a peace-time basis, so that for at least eight months of the fiscal year the loads in many of the municipalities supplied had not reached normal proportions, and more especially was this true in the case of those municipalities where large blocks of power had been supplied for munition production. In some of these municipalities the loads declined 25 per cent. or more when the munition loads ceased, and it was not until the month of August that the loads reached normal proportions, from which time the recovery of commercial industries in the Province was so rapid that practically all of the available power was being used by the end of the year.

When the war broke out and there was pressing need for munitions, the Canadian manufacturers were approached by the Government with a view to ascertaining to what extent Canada could participate in supplying these demands, and while many manufacturing companies were willing to convert their entire organizations to the production of munitions, this would have been useless had not the Commission been able during the first three years of the war to supply the large quantities of power necessary to operate these plants.

In 1917 the Commission realized that its reserve of power available for the manufacture of munitions would soon be exhausted, and steps were then promptly taken to augment the supply.

This necessitated the expenditure of large sums of money on the construction of extensions to generating plants, transmission lines and systems, approximately \$7,600,000 being expended to produce 54,000 horse-power, all of which would have been available for munitions manufacture. The Commission also made arrangements whereby the Ontario Power Company of Niagara Falls was relieved of

supplying 10,000 horsepower for export, in order that this additional power might be available for munitions manufacture.

The cost of the above extensions was greatly increased by the rapid rise in the cost of labour, equipment and materials. In purchasing the equipment for these emergency plants it was found to be impossible to obtain all the necessary machinery and equipment in Canada, and no course was open but to purchase much of the apparatus in the United States in order that these plants might be constructed in the shortest possible space of time in order to be available for the supply of power for munitions production. On this account the Commission was obliged to expend large sums in duties and war taxes, amounting to over \$652,000, or an average of 37½ per cent. of the purchase price.

During this period the labour situation was acute; not only was it almost impossible to obtain sufficient labour to carry on the work expeditiously, but the cost of labour had nearly doubled over that of pre-war days. Moreover, as is generally known, the efficiency of labour had decreased in proportion to the increase in the cost of same. The general scarcity of labour and increase in wages during the year resulted in the amount of the operating pay-rolls increasing in many cases by more than 60 per cent. over that of the previous year. The cost of materials also increased approximately 25 per cent. These factors had a most serious effect upon the operations of the Commission and were utterly beyond the power of the Commission to control, as has been the case with industries of every nature throughout the Province.

However, in spite of the enormous, uncontrollable increase in operating expenses, the revenues of the Commission have been in the main sufficient to meet all operating expenses and necessary fixed charges, practically the only exceptions being those municipalities in which large blocks of power were supplied for the manufacture of munitions, and which after the cessation of hostilities were not replaced by commercial loads until late in the year. In most of these municipalities the building up of loads to normal conditions during the coming year will place them on a paying basis, and where such is not the case a readjustment of rates may be necessary.

At the beginning of the year, the Commission fixed a schedule of rates covering the estimated cost of service to all municipalities. These rates brought in a total revenue of \$3,729,705.75, while the actual cost of service was \$3,860,700.79, which includes the total expenses for interest, cost of power, operation and maintenance, amounting to \$3,243,329.02, and all the necessary fixed charges and reserves, such as sinking fund, reserves for renewals and contingencies, amounting to \$617,371.77. After meeting all operating expenses and setting aside the reserves as above set out (in accordance with Section 23 of the Power Commission Act) the expenditures exceeded the revenue by \$130,995.04; the cost of service to all municipalities exceeding the estimates by but 3.5 per cent., a very remarkable showing in view of the phenomenal increase in the cost of labour and material. Bills and credit memoranda have been sent to the municipalities for the difference between the actual cost of service and the bills as rendered, which have already been taken up and incorporated in the books of the municipalities.

For the first time the operating reports and balance sheets of the municipalities, which appear in Volume II, will include in the cost of power, the annual adjustment from the books of this Commission, and will reflect complete operating results and all liabilities of every kind growing out of the co-operative development and transmission and the municipal distribution of electrical energy.

AUDIT

In addition to that audit carried on under the direction of the Auditor for the Province of Ontario, covering the period from the appointment of the Commission to the end of the fiscal period, October 31st, 1916, it was ordered and directed by an Order-in-Council dated May 3rd, 1916, that an independent audit and investigation of the Commission's records and books of account was to be made and for this purpose the accounting firm of Messrs. Clarkson, Gordon and Dilworth received the appointment under this Order-in-Council and shortly after its issuance commenced their duties. Messrs. Clarkson, Gordon and Dilworth completed their investigations and audit February 16th, 1918, which, as before stated, covered the activities of the Commission from the date of its appointment, 1906, up to and including the last day of the fiscal year ending October 31st, 1916, and their report was duly presented to the Treasurer of Ontario. Subsequent to this date and at the request of the Commission, the Auditors were instructed to make in like manner an audit of the accounts for the year 1917, which was done and reported upon to the Provincial Treasurer under date of August 22nd, 1918. As appointees of the Commission the audit was continued by the same firm and completed under date of April 16th, 1919, for that period ending October 31st, 1918, since which time a continuous monthly audit has been carried on, and the latest report covers the period ending October 31st, 1919, and was submitted under date of April 3rd, 1920.

NIAGARA SYSTEM

Early in the year 1917 the Commission realized that the enormous demands for power for war munition work would soon exhaust the available supply in the Niagara District, and in the summer of that year the Ontario Power Company of Niagara Falls, which is owned and operated by the Commission, approved of an expenditure of over \$2,000,000 to install a temporary pipe line and two additional generators having a total capacity of approximately 45,000 horse-power, to obtain additional power for munition manufacturing in this district. By installing a temporary wood-stave pipe line, over a year's time was saved, and water was turned into the pipe line within a year from the date the construction work was started.

On December 31st, 1918, The Toronto Power Company ceased to supply the Ontario Power Company of Niagara Falls with 11,000 horse-power that was being supplied under the Power Controller's orders, and on March 1st, 1919, a further block of 13,200 horse-power was cut off. The extension to the Ontario Power Company of Niagara Falls was sufficient to take care of these reductions in power supply and of an additional 21,000 horse-power for additional loads on the system.

At the time of the signing of the Armistice, the Commission was supplying over 80,000 horse-power to 360 plants working on the manufacture of munitions. Within eight months after the signing of the Armistice, the industries in the district had absorbed all of this available power, and so rapid was the recovery of the industries, that before the end of the year all of the available power supply was used up and it was necessary for the Commission to limit the amount of power supplied to the municipalities on this System.

Anticipating a shortage of power, the Commission is negotiating for an additional supply, and expects to obtain at least 20,000 horse-power for this System early in the coming year.

Queenston-Chippawa Development

The construction work on the Queenston-Chippawa Development, which was commenced in May, 1917, has been pushed night and day since that time. This work, however, has been carried on under great difficulties owing to the scarce, inefficient and unstable common labour supply.

Since this project was started, the vast increase in the prospective market for power has necessitated increasing the capacity of the power canal which, together with a corresponding increase in the capacity of the generating station, will greatly add to the capital cost of the development, and, based on this increased capacity and with construction under constantly increasing cost of labour and materials, the development will cost much more than the original estimate for the scheme of smaller capacity.

The estimated progress schedule for work on the development was maintained in all important particulars except in rock excavation, which, on account of the above mentioned labour difficulties, is somewhat behind our estimated schedule, but present progress shows marked improvement and is greater than schedule.

In the construction of the canal for this project it was necessary for the Commission to acquire approximately 3,100 acres of land, of which approximately 1,000 acres will be ultimately required for construction purposes.

The route of this canal traverses, in the most part, very valuable properties, cutting through orchards, vineyards, small fruit and farming districts in such a manner as to preclude the possibility of securing such sections of land only as might be necessary for construction purposes. This fact necessitated the acquirement, in some cases, of farms intact and tracts of land not necessary for the ultimate requirements of the works and which will later have to be disposed of by the Commission when the construction work has been completed.

In connection with this surplus land, the Commission was faced with the problem of how best to deal with such valuable lands. To allow them to remain idle during the period of construction—four or five years—was considered to be unjustifiable, and to rent the properties at an equitable figure in view of the circumstances, was found to be impossible. It was therefore decided to operate these lands in order to maintain them in such a condition that they could be sold advantageously when the construction work on the canal has been completed. It was not anticipated, however, that the revenue obtained from such operation would be sufficient to meet all costs in connection with the farms, but it is expected that the revenue from crops and fruit yield during the next two years will materially reduce operating deficits.

Assuming that the total sum not covered by revenue to date is all charged by way of maintenance or betterments to the property, it is found to be a reasonable percentage, viz.: 5 per cent. of the total amount expended on right-of-way.

SEVERN SYSTEM

The abnormal demands for power for munition manufacture by municipalities on this System made it necessary for the Commission to extend the Big Chute Generating Station, at a cost of approximately \$215,000.00, from which extension an additional 2,000 horsepower was obtained for munition work.

After the Armistice was signed, the loads on the Severn System decreased over 25 per cent. in those municipalities supplying large blocks of power for munition manufacture, and had not reached normal conditions at the end of the year.

An increase in operation and maintenance of the System during the year of \$18,168.34 or 47 per cent. together with an increase in interest charges—largely due to the increase in the power plants—amounting to \$19,294.73 or 54 per cent., prevented this System from giving as favourable an operating statement as was anticipated, the actual cost of the service exceeding the estimate by about 22 per cent. With the restoration of normal conditions, satisfactory operating results are confidently anticipated.

EUGENIA SYSTEM

This System having a large storage capacity, is used during periods of the day to supply power to the Severn System, and credit is allowed this System on account of such power supplied. The dropping off, however, of munition loads on the Severn System reduced the amount of power used by that System during the year, and seriously affected the revenue of the Eugenia System.

The operation and maintenance expense increased by \$17,493.41, or 50.7 per cent. over the previous year, and the interest charges increased \$8,708.52, or 17.1 per cent. over those of 1918. However, the actual cost of operation, maintenance and the necessary fixed charges only exceeded the estimate by approximately 5.9 per cent.

During the year a large number of municipalities in the Bruce Peninsula applied to the Commission for power, and many of them are arranging to submit Hydro By-laws to their electors at the coming municipal elections. It is expected that with nominal rate adjustments and these additional loads the financial operation of this System will be entirely satisfactory.

WASDELL'S SYSTEM

The generating plant of the Wasdell's System differs from the other generating plants supplying power in the Northern District, in that it does not depend on the storage of water for its continuous maximum output, and this characteristic is of considerable value to the municipalities in the Northern District, as all the generating plants in this district, with the exception of the Muskoka System, are tied together, and power may be used to maximum capacity of this plant throughout the day so as to permit the other generating plants in the district to increase their water storage.

The cost of service during the year increased the amount of the power bills as rendered, by \$2,490.01, or 7.7 per cent., due to the fact that the operation and maintenance expenses increased 18.5 per cent., and the interest charges 8.3 per cent., while at the same time the decrease in demand for power for munition plants on the Severn System, cut down the transfer of power to that System. Plans are under way to secure additional load to the capacity of the generating plant.

MUSKOKA SYSTEM

The operation and maintenance expenses of this System increased \$2,235.54, or 26 per cent. over the figure for 1918, and the interest charges increased over the figures for 1918 by \$871.62, or approximately 11 per cent. This large increase in operating expenses with a fixed revenue from the Anglo-Canadian Leather Company, which is being supplied with power under a long-term contract at a rate based on normal operating expenses, resulted in this System operating with a deficit for the year of \$2,469.32.

Arrangements are now being made to increase the amount of power available on this System, for which a demand already exists, which should place the operation of this System on a more satisfactory basis.

ST. LAWRENCE SYSTEM

The operation of this System was first commenced in December, 1913, a contract being made with the M. F. Beach Power Company for 500 horsepower to supply power to the municipalities in this district.

In order to supply the increased loads in the district and to supply power to other municipalities which had made application to the Commission, a contract was made with the Cedar Rapids Transmission Company, this power being delivered at a high-tension station constructed at Cornwall. Power was first received from this new station on May 1st, 1919. This extension increased the capital expenditure from approximately \$180,000 to over \$570,000, and the load supplied in this district increased from less than 500 horsepower to over 2,000 horsepower during the last six months of the year.

The actual cost of operation, maintenance and the necessary fixed charges for the year increased by \$6,078.93, or approximately 11 per cent. The load is growing rapidly and more favourable results are anticipated during 1920.

THUNDER BAY SYSTEM

During the past ten years power has been supplied to Port Arthur by the Commission under a contract for power received from the Kaministiquia Power Company. This contract expires in December, 1920, and at the request of the municipalities in this district, the Commission commenced the construction of a development on the Nipigon River at Cameron's Falls, in the fall of 1918.

The ultimate capacity of this plant will be 75,000 horsepower. The first installation will have a capacity of approximately 30,000 horsepower, and it is expected that the plant will be ready for operation about December 1st, 1920.

RIDEAU SYSTEM

Power was first supplied to this System from the Merrickville plant where the Commission had a contract for 500 horsepower, and while this plant was sufficient to supply the needs of the district during the first year's operation, the rapid growth in the loads of the municipalities supplied necessitated the Commission going ahead with the development of High Falls on the Mississippi River, which development, when completed, will supply approximately 3,000 horsepower. The first unit of this plant will be put into operation about May, 1920.

CENTRAL ONTARIO SYSTEM

Just prior to the signing of the Armistice, this System was fully loaded and the installation of a third generating unit of 3,750 k.v.a. capacity was in progress at Healey Falls in order to meet the increasing demand. When the war terminated, the munitions load fell off abruptly, the decrease being nearly 30 per cent. of the total pre-armistice load. After a period of quiescence, new loads began to develop so that by the beginning of the last quarter of the year normal conditions had again returned. As a consequence of the inactive period the revenues of the Power Department declined by 30 per cent., and of the Local

Systems by 11 per cent. from those of the previous year. Advancing wage rates and material costs resulted in an increase of 12 per cent. in the cost of operation of the Power Department, while the operating costs of the Local Systems declined by 10 per cent. owing to decreased power demand. The fixed charges of the Power Department increased by 12 per cent. owing to completion of the Healey Falls development and, as during the greater part of the year the capacity of the new unit was not required, this increased the burdens of the System without bringing any compensating revenue.

The operation of the Pulp Mill, which had been profitable previously, was conducted at a loss this year owing to low market prices and advancing manufacturing costs. Since the end of the year market conditions have entirely changed and the operations of the mill are now yielding very large profits.

Since August, 1919, the demand for power on this System has increased to such an extent that all available generating plants are fully loaded and construction work on a new 10,000 horsepower development at Ranney's Falls will be commenced this spring.

It is expected that the increased loads will return sufficient revenue to bring about profitable operation in almost all municipalities and that in cases where rate increases are necessary through rising costs, these increases will not be large.

NIPISSING SYSTEM

The increase in loads on this System during the year was such that the demand for power exceeded the capacity of the hydraulic generating plant and necessitated the operation of the steam plant during low-water periods of the year. The operation of this steam plant, with the increased cost of coal as well as the increased cost of operation and maintenance of the plant, seriously handicapped the System and resulted in a net operating loss for the year amounting to \$1,089.53.

The installation of storage dams will be completed some time during the coming summer, so that during periods of high water, the water supply may be stored, and thereby obviate the necessity of operating the steam plant during low water periods, and with this change the operation of the plant should show a good surplus.

The Commission submits its Report with a feeling of satisfaction, knowing full well that its activities have been subjected to an enquiry of the most searching nature, the result of which is a vindication of the policy of public ownership and operation of electrical utilities, and of the Commission's methods of management and operation.

The Commission feels this to be a fitting opportunity of acknowledging the untiring zeal and faithful attention to duty on the part of all officers and members of its staff.

Respectfully submitted,

ADAM BECK,
Chairman.

TORONTO, ONT., February 25th, 1919.

COLONEL SIR ADAM BECK, Kt., LL.D.,

*Chairman, Hydro-Electric Power Commission of Ontario,
Toronto, Ont.*

SIR,—I have the honour to transmit herewith the third volume of the Twelfth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1919.

I have the honour to be,

Sir,

Your obedient servant,

W. W. POPE,

Secretary.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

COLONEL SIR ADAM BECK, Kt., LL.D., Chairman.

HONOURABLE I. B. LUCAS, M.P.P.

LT. COL. HON. D. CARMICHAEL, D.S.O., M.C.

W. W. POPE, Secretary.

F. A. GABY, Chief Engineer.

TWELFTH ANNUAL REPORT

OF THE

Hydro-Electric Power Commission of Ontario

VOLUME III

HYDRAULIC INVESTIGATIONS

STREAM FLOW MEASUREMENTS

The results of the measurements of stream flow in the Province during the year October 1st, 1918, to September 30th, 1919, are published herewith:—

The grouping is under five arbitrary divisions based on the districts covered by the different field offices, and is of no material significance. The sections under the groups are arranged alphabetically as to the names of the rivers as is also the case in the general index.

The year's work has been carried on without change in the personnel of the staff employed and therefore the results have the advantages consequent to such conditions.

The wide variation in the weather in this Province, produces influences on the factors governing the estimates of flow of streams, which are most apparent in the winter, when it is most difficult to secure good discharge measurements, and which at the same time necessitate more frequent measurements than are ordinarily required. Where sufficient measurements have been secured to justify estimates of winter flow, during the period when the sections were affected by ice, such estimates have been made. At some of the stations subject to ice effect, however, no measurements were obtainable, and consequently estimates of flow have not been made for that period. On the other hand, there are sections for which estimates are given over the winter period, during which no measurements were actually made, but where sufficient assurance existed to make such estimates reasonably justifiable. These latter sections are all in the north-western part of the Province.

The winter season embraced by the period of this report was exceptionally mild and entirely unlike the winter preceding. The total run-off is generally higher than that of the preceding year, and yet, as was to have been expected, the maximum run-offs were in nearly every instance lower, and the winter run-off higher.

It is necessary to draw attention to the fact that in the table showing the relation of run-off to precipitation, some of the precipitation stations, though considered the most suitable for the purpose, may possibly give results varying very considerably from the mean precipitation of the basin. The variations in the percentages of run-off to rainfall are attributed partially to this reason.

Altogether, estimates of flow at forty-four stations in the Province are published in this report.

Regular Stations

EASTERN ONTARIO DISTRICT

River	Location	Drain- age Area Sq. Miles	Township	County or District
Black	near Washago	585	Rama	Ontario
Bonnechere	at Renfrew	910	Horton	Renfrew
Madawaska	at Madawaska	800	Murchison	Nipissing
Maganatawan, north.	near Burk's Falls	107	Armour	Parry Sound
" south.	" " "	257	" " "	" " "
Mississippi	at Appleton	1,150	Ramsay	Lanark
" " "	at Ferguson's Falls	1,042	Drummond	" " "
" " "	at Galetta	1,456	Fitzroy	Carleton
" " "	near Snow Road	446	Sherbrooke	Lanark
Moir	near Foxboro	1,038	Thurlow	Hastings
Muskoka, south	at Black's Bridge	668	Draper	Muskoka
" north	near Port Sydney	560	Stéphenson	" " "
Napanee	near Napanee	300	Camden	Addington
Petawawa	near Petawawa	1,572	Petawawa	Renfrew
Tay	near Glen Tay	204	Bathurst	Lanark
York	near Bancroft	374	Faraday	Hastings

Black River near Washago

Location—At the highway bridge known as Kennedy's Bridge, about 5 miles south-east of the Town of Washago, on lot 1, concession G, Township of Rama, County of Ontario.

Records Available—Discharge measurements at first bridge from August, 1913, to January, 1914. Discharge measurements at Kennedy's Bridge from February, 1914, and daily gauge heights from May 5, 1915.

Drainage Area—585 square miles.

Gauge—A bench mark (elevation 30.00), painted on tie-rod on downstream side of bridge, is used in ascertaining the water elevation, by measuring down to the surface of the stream with a graduated staff. This is referred to a bench mark (elevation 32.62) on north-west corner of right abutment.

Channel and Control—The channel is straight for 300 feet above and 1,000 feet below the gauging section. The banks and control can be considered permanent, as the velocity here is never very high. The bed of the stream is composed of rock.

Discharge Measurements—Made from the bridge and wading section 500 feet above bridge at low water.

Winter Flow—Owing to the somewhat sluggish flow at this section, ice from December to March forms to a great thickness, and relation of gauge height to discharge is seriously affected during that period. Measurements are made to determine the winter flow.

Regulation—The flow at this section during May, June and July is controlled to a large extent by logging dams above. The operation of gates at these dams causes fluctuations in gauge heights, amounting to several feet at the gauge. At times logs lodge below section, causing considerable backwater.

Accuracy—For three months in the early summer the river stage is subject to large fluctuations, and the accuracy of the discharge depends upon accuracy of mean daily gauge heights. Rating curve not well defined at all stages.

Observer—Pearl Carrick, Washago.

Discharge Measurements of Black River near Washago for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Oct. 9.....	.....	119	662	1.24	23.08	821
Dec. 17... ..	Ronald, F.....	119	852	2.08	24.79	1,774
1919						
Feb. 3.....	".....	119	562	1.07	23.08	599 (a)
" 18.....	".....	110	491	.94	22.46	460 (a)
April 11.....	Hatton, M.....	119	923	2.46	25.42	2,273
" 16.....	Ronald, F.....	119	886	2.14	25.08	1,892
May 20.....	Hatton, M.....	119	729	1.56	23.75	1,136
June 10.....	".....	119	739	1.42	23.83	1,049 (b)
July 9.....	".....	119	497	.57	21.75	284
Aug. 20.....	".....	100	389	.35	20.42	135
Sept. 24.....	Ronald, F.....	45	37	1.27	19.90	47

(a) Ice measurement.

(b) Log jam below section.

October			November			December			January			February			March			April			May			June			July			August			September		
Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.				
1	21.54	249	22.67	585	840	23.23	840	25.50	2360	23.25	660	22.40	444	26.85	3390	24.50	1620	23.83	1190	21.38	218	20.65	117	20.29	85	20.65	117	20.65	117	20.65	117	20.65	117		
2	21.52	244	22.81	640	735	23.07	735	25.52	2370	23.17	625	22.44	458	26.48	3090	24.42	1570	23.73	1130	21.38	218	20.65	117	20.17	78	20.65	117	20.65	117	20.65	117	20.65	117		
3	21.54	249	22.83	650	760	23.02	760	25.58	2410	23.10	600	22.46	466	26.21	2890	24.92	1920	23.75	1140	21.38	218	20.52	104	20.15	78	20.52	104	20.52	104	20.52	104	20.52	104		
4	21.50	240	22.98	715	810	23.17	810	25.66	2470	23.00	560	22.44	458	25.92	2670	25.08	2040	23.52	1000	21.33	209	20.46	98	20.10	75	20.46	98	20.46	98	20.46	98	20.46	98		
5	21.79	304	23.28	865	940	23.42	940	25.92	2670	23.00	560	22.58	510	25.69	2500	25.25	2170	23.68	1100	21.71	286	20.44	96	20.02	71	20.44	96	20.44	96	20.44	96	20.44	96		
6	22.52	525	23.23	840	870	23.29	870	26.17	2860	22.92	525	22.63	530	25.58	2410	25.17	2110	23.38	920	21.75	295	20.44	96	19.96	68	20.44	96	20.44	96	20.44	96	20.44	96		
7	23.15	800	23.29	870	850	23.25	850	26.10	2730	22.88	510	22.65	540	25.56	2400	24.92	1920	23.71	1110	21.60	262	20.41	81	19.94	67	20.41	81	20.41	81	20.41	81	20.41	81		
8	23.23	840	23.40	930	820	23.19	820	25.81	2510	22.81	495	22.54	495	25.52	2370	24.58	1680	23.54	1010	21.54	249	20.21	80	19.93	67	20.21	80	20.21	80	20.21	80	20.21	80		
9	23.06	755	23.46	965	765	23.08	765	25.33	2150	22.83	491	22.62	525	25.42	2310	24.05	1330	23.75	1140	21.40	263	20.19	80	19.85	62	20.19	80	20.19	80	20.19	80	20.19	80		
10	23.00	725	23.67	1030	765	23.08	765	25.33	2150	22.75	469	22.60	520	25.31	2210	23.75	1140	24.27	1470	21.54	249	20.15	78	19.90	65	20.15	78	20.15	78	20.15	78	20.15	78		
11	22.85	660	23.67	1090	765	23.08	765	25.54	2310	22.75	462	22.58	510	25.42	2300	23.79	1160	24.21	1430	21.48	256	20.05	78	19.90	65	20.05	78	20.05	78	20.05	78	20.05	78		
12	22.71	600	23.58	1040	710	22.96	710	25.73	2450	22.69	441	22.60	520	25.56	2400	24.15	1390	24.21	1360	21.60															

Day

Monthly Discharge of Black River near Washago for the year ending
Sept. 30th, 1919

Drainage Area, 585 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918) ..	840	240	583	1.44	.41	1.00	1.15
November " " ..	1,150	585	906	1.97	1.00	1.55	1.73
December " " ..	2,390	610	1,400	4.09	1.04	2.39	2.76
January .. (1919)	2,860	575	1,595	4.89	.98	2.73	3.15
February	660	392	481	1.13	.67	.82	.85
March	4,500	444	2,080	7.69	.76	3.56	4.10
April	3,390	1,680	2,345	5.80	2.87	4.01	4.47
May	2,170	1,040	1,448	3.71	1.78	2.48	2.86
June	1,480	229	815	2.53	.39	1.39	1.55
July	429	125	246	.73	.21	.42	.48
August	117	62	91	.20	.11	.16	.18
September	85	58	65	.15	.10	.11	.12
The year	4,500	58	1,008	7.69	.10	1.72	23.40

Bonnechere River at Renfrew

Location—One-half mile below Raglan St., Town of Renfrew, Township of Horton, County of Renfrew.

Records Available—Discharge measurements from September, 1916. Daily gauge readings from November 1, 1916.

Drainage Area—910 square miles.

Gauge—On the right bank of the river at the section, a box chain gauge with nine feet of standard gauge plates. Distance from end of weight to marker is 12.43 feet.

Channel and Control—The channel is straight for 100 feet above and 300 feet below the station, but both above and below the station long sharp curves occur. There is a low clay bank on the right, and a high clay bank on the left. At extreme high water there may be an escape from this channel of some water from higher above the section to points below the section. The bed of the stream is composed of clean small stones.

Regulation—The Round Lake Dam, and the Golden Lake Dam for power purposes, and the dams on the upper river for lumbering purposes have large regulating effects on this river. The power plants in Renfrew, running twenty-four hours to their full capacity, and having little pondage, will not seriously affect the estimate of mean gauge heights.

Observer—R. Dalton, Renfrew.

Discharge Measurements of Bonnechere River at Renfrew for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Jan. 29.....	Ronald, F.....	122	241	2.75	103.25	663 (a)
Mar. 4.....	".....	119	214	2.52	102.96	541 (a)
April 1.....	".....	132	276	3.34	103.25	923
July 25.....	Hatton, M.....	120	171	1.75	102.83	298
Sept. 10.....	Ronald, F.....	119	173	1.69	102.81	292

(a) Ice measurement.

Daily Gauge Height in feet, and Discharge in second-feet of Bonnechere River at Renfrew for year ending 30th September, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	102.67	242	103.42	860	103.33	750	104.00	1700	104.08	1840	103.17	575	103.29	705	104.33	2280	104.71	2950	103.50	960	102.83	306	102.42	193
2	102.50	205	103.25	660	103.17	575	103.92	1580	103.50	960	102.96	384	103.29	705	104.58	2720	104.58	2720	103.17	575	102.50	205	102.58	221
3	102.83	306	103.50	960	103.33	750	103.50	960	103.92	1580	103.25	660	103.58	1070	104.50	2580	104.67	2880	103.08	482	.....	40	102.67	242
4	102.58	221	103.50	960	103.42	860	104.00	1700	103.29	705	103.00	410	103.58	1070	104.42	2440	104.67	2880	103.08	482	.....	40	102.50	205
5	103.25	660	103.58	1070	103.50	960	104.00	1700	103.25	660	103.00	410	103.67	1200	104.33	2280	104.75	3020	102.92	358	102.67	242	102.42	193
6	103.50	960	103.58	1070	103.33	750	104.00	1700	103.52	985	103.25	660	103.79	1380	104.38	2370	104.08	1840	102.58	221	102.67	242	102.50	205
7	103.08	482	103.50	960	103.58	1070	104.08	1840	103.17	575	103.33	750	103.87	1500	104.29	2210	104.42	2440	102.83	306	102.57	219	102.58	221
8	103.08	482	103.08	482	103.25	660	103.92	1580	103.08	482	102.92	358	103.85	1470	104.33	2280	104.50	2580	102.67	242	102.57	219	102.50	205
9	103.08	482	103.58	1070	103.33	750	103.58	1070	102.98	397	102.85	375	103.87	1500	104.33	2280	104.58	2720	102.50	205	102.92	358	102.50	205
10	102.67	242	103.42	860	103.33	750	103.75	1320	103.92	1580	103.17	575	104.08	1840	104.25	2140	105.50	4330	102.67	242	102.58	221	102.79	286
11	102.92	358	103.42	860	103.83	1440	104.00	1700	103.08	482	103.00	410	104.33	2280	104.29	2210	105.25	3890	102.67	242	102.58	221	102.58	221
12	102.92	358	103.33	750	103.25	660	104.08	1840	103.75	1320	103.00	410	104.35	2320	104.39	2390	105.08	3600	102.62	230	102.25	170	102.67	242
13	102.92	358	103.33	750	103.33	750	104.08	1840	103.58	1070	102.92	358	104.19	2040	104.29	2210	104.92	3320	102.33	180	102.25	170	102.50	205
14	102.92	358	103.33	750	103.42	860	103.67	1200	103.42	860	102.75	270	104.21	2070	104.33	2280	104.75	3020	102.83	306	102.83	306	102.58	221
15	102.92	358	103.25	660	103.75	1320	103.50	960	103.25	660	102.83	306	104.17	2000	104.25	2140	104.38	2370	102.33	180	102.83	306	102.58	221
16	102.92	358	103.33	750	103.33	750	103.17	575	103.33	750	102.87	328	104.23	2110	104.50	2580	104.17	2000	102.92	358	102.58	221	102.50	205
17	102.58	221	103.33	750	103.58	1070	103.08	482	103.33	750	103.08	482	104.42	2440	104.46	2510	104.17	2000	102.75	270	.....	40	102.58	221
18	102.75	270	103.58	1070	103.58	1070	103.25	660	103.33	750	104.38	2370	104.42	2440	104.46	2510	103.83	1440	102.08	154	102.58	221	102.67	242
19	102.08	154	103.83	1440	103.50	960	103.33	750	103.33	750	104.00	1700	104.33	2280	104.42	2440	104.00	1700	102.58	221	102.75	270	102.33	180
20	102.92	358	103.75	1320	103.42	860	103.08	482	103.17	575	103.75	1320	104.25	2140	104.42	2440	103.75	1320	102.58	221	102.58	221	102.83	306
21	103.08	482	103.92	1380	103.50	960	103.25	660	103.29	705	104.25	2140	104.25	2140	104.83	3160	103.75	1320	102.75	270	102.58	221	102.42	193
22	103.08	482	103.58	1070	103.58	1070	103.50	960	103.33	750	103.83	1440	104.25	2140	105.08	3600	103.58	1070	102.96	384	102.58	221	102.75	270
23	102.92	358	103.58	1070	103.67	1200	103.25	660	103.37	800	102.83	306	104.25	2140	108.50	9580	103.83	1440	102.58	221	102.50	205	102.67	242
24	103.00	410	103.58	1070	103.58	1070	103.17	575	103.04	446	104.25	2140	104.33	2280	106.83	6660	103.88	1520	102.92	358	102.67	242	102.58	221
25	103.00	410	103.67	1200	103.42	860	103.67	1200	103.25	660	104.42	2440	104.42	2440	105.58	4470	103.83	1440	102.75	270	102.67	242	102.58	221
26	103.00	410	103.50	960	103.25	660	103.50	960	103.33	750	104.42	2440	104.21	2070	105.17	3750	103.83	1440	102.83	306	102.67	242	102.73	270
27	103.17	575	103.58	1070	103.67	1200	103.25	660	103.02	446	104.50	2580	104.25	2140	104.50	2580	103.83	1440	102.33	180	102.67	242	102.33	180
28	103.17	575	103.58	1070	103.92	1580	103.08	482	103.08	482	104.25	2140	104.46	2510	104.17	2000	103.58	1070	102.37	186	102.50	205	102.25	170
29	103.25	660	103.33	750	103.92	1580	103.33	750	.....	.....	103.58	1070	104.42	2440	104.50	2580	103.50	960	102.88	334	102.50	205	102.83	306
30	103.25	660	103.42	860	103.67	1200	103.29	705	.....	.....	103.67	1200	104.42	2440	104.92	3310	103.42	860	102.83	306	102.58	221	102.75	270
31	103.50	960	.....	.....	102.67	1200	103.33	750	.....	.....	103.83	1440	.....	.....	104.87	3230	.....	.....	102.92	358	102.75	270	.....	.....

NOTE.—Aug. 3rd, 4th and 17th—water below gauge. Flow probably between 30 and 50 C.F.S.

Monthly Discharge of Bonnechere River at Renfrew for Year ending Sept. 30th, 1919

Drainage Area, 910 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	960	154	426	1.05	.17	.47	.54
November "	1,580	482	951	1.74	.53	1.05	1.17
December "	1,580	575	970	1.74	.63	1.07	1.23
January (1919)	1,840	482	1,097	2.02	.53	1.21	1.39
February	1,840	397	811	2.02	.44	.89	.93
March	2,580	270	1,045	2.84	.30	1.15	1.33
April	2,510	705	1,910	2.76	.77	2.10	2.34
May	9,580	2,000	2,975	10.53	2.20	3.27	3.77
June	4,330	860	2,186	4.76	.95	2.40	2.68
July	960	154	310	1.05	.17	.34	.39
August	358	40	219	.39	.04	.24	.28
September	358	170	231	.39	.19	.25	.28
The year	9,580	40	1,094	10.53	.04	1.20	16.29

Madawaska River at Madawaska

Location—50 feet above the G.T. Ry. bridge, Canada Atlantic branch, 500 yards east of the Madawaska Station, Township of Murchison, District of Nipissing.

Records Available—Discharge measurements from September, 1915, and monthly thereafter, and gauge readings from September 27, 1915.

Drainage Area—800 square miles.

Gauge—0.3 feet of standard gauge plates secured vertically to pile, three feet west of face of east abutment. 3.9 feet of standard gauge plates secured vertically to ice guard crib of east abutment.

Channel and Control—Channel is straight for about 400 feet above the section, curving slightly to the right under the bridge. The banks are sandy, and not liable to overflow. The bed of the river is soft, and there are some weeds above the section. The point of control is not clearly defined.

Discharge Measurements—Made about fifty feet above gauge from a boat.

Winter Flow—Affected by ice conditions.

Regulation—Lumber interests on the river above the section operate dams for driving purposes.

Accuracy—Open water rating curve for ordinary stages changing slightly.

Observer—G. Wormke, Madawaska.

Discharge Measurements of Madawaska River at Madawaska for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 20.....	Hatton, M.....	88	687	1.11	104.17	765 (a)
1919						
Jan. 30.....	Ronald, F.....	81	570	.98	104.12	558 (a)
Feb. 20.....	"	80	489	.94	103.50	462 (a)
May 2.....	"	103	1,016	1.76	107.58	1,784
June 2.....	"	102	1,217	1.85	108.92	2,257
" 3.....	"	102	1,185	1.84	108.58	2,179
July 23.....	Hatton, M.....	77	475	.66	101.83	313
Aug. 26.....	"	76	482	.40	101.52	194
Sept. 26.....	"	74	435	.39	101.33	170

(a) Ice measurement

Monthly Discharge of Madawaska River at Madawaska for year ending September 30th, 1919

Drainage Area, 800 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October ... (1918)	955	530	840	1.19	.66	1.05	1.21
November. "	1,270	715	872	1.59	.89	1.09	1.22
December "	1,200	705	936	1.50	.88	1.17	1.55
January .. (1919)	1,250	525	873	1.56	.66	1.09	1.26
February	520	418	481	.65	.52	.60	.62
March	1,110	394	630	1.39	.49	.79	.91
April	2,040	775	1,512	2.55	.97	1.89	2.11
May	3,190	1,550	2,095	3.99	1.94	2.62	3.02
June	2,980	565	1,556	3.72	.71	1.94	2.16
July	545	229	355	.68	.29	.44	.51
August	260	167	209	.32	.21	.26	.30
September	184	139	163	.23	.17	.20	.22
The year	3,190	139	878	3.99	.17	1.10	14.93

Maganatawan River (North Branch) near Burk's Falls

Location—One-half mile north of Burk's Falls station, 200 feet upstream from the Grand Trunk Railway bridge, on lot 7, concession 10, Township of Armour, District of Parry Sound.

Records Available—Monthly discharge measurements from June, 1915. Daily gauge readings from August 1, 1915.

Drainage Area—107 square miles.

Gauge—Vertical steel staff with enamelled face fastened to a 2 x 4 scantling and connected to a wooden platform on the right shore about 250 feet above G.T.R. bridge. Zero of the gauge (elev. 28.14 feet) is referred to a bench mark (elev. 35.00 feet) painted on top of 5-ft. iron pipe 20 feet above gauging station, and a bench mark (elevation 49.53) painted on upstream side of right abutment of G.T.R. bridge.

Channel and Control—Straight for about 200 feet above and 100 feet below the gauging station to the falls. The banks are high and wooded, and are not liable to overflow. The bed of the stream is composed of clay and a few rocks, practically permanent. The velocity is moderate.

Discharge Measurements—Made by wading with a small Price current meter, in high water just above gauge, in low water 150 feet below gauge.

Winter Flow—Relation of gauge height to discharge is slightly affected by ice. Measurements are taken to determine the winter flow.

Accuracy—The rating curve is fairly well defined for lower gauge readings.

Observer—Henry Stroud, Burk's Falls.

Discharge Measurements of Maganatawan River (North Branch) near Burk's Falls for year ending 30th September, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Feb. 1.....	Ronald, F.....	73	153	.76	29.97	117 (a)
" 19.....	"	73	139	.72	29.72	100 (a)
April 14.....	"	89	662	1.03	32.43	684
" 14.....	"	89	662	1.02	32.43	678
July 10.....	"	35	58	.67	29.14	39
Sept. 25.....	"	42	75	.87	29.74	64

(a) Ice measurement.

Daily Gauge Height in feet, and Discharge in second-feet, of Maganatawan River (North Branch) near Burk's Falls for
year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	29.85	122	30.89	326	30.52	246	30.81	307	29.89	111	29.56	66	32.43	795	31.43	462	31.64	525	29.43	63	28.97	31	29.45	65
2	29.89	128	30.81	307	30.52	246	30.72	288	29.89	111	29.56	66	32.47	810	31.39	450	31.14	386	29.43	63	28.97	31	29.43	63
3	29.93	135	30.72	288	30.47	236	30.64	271	29.89	111	29.56	66	32.49	815	31.39	450	30.97	345	29.43	63	28.97	31	29.41	61
4	29.97	142	30.68	280	30.43	227	30.56	255	29.89	111	29.54	64	32.51	825	31.43	462	30.64	271	29.45	65	28.95	30	29.37	57
5	30.22	187	30.64	271	30.39	219	30.47	215	29.89	111	29.56	66	32.47	810	31.39	450	30.56	255	29.47	67	28.93	29	29.35	55
6	30.76	297	30.60	263	30.35	211	30.39	199	29.89	111	29.56	66	31.06	366	31.39	450	30.54	250	29.49	69	28.91	28	29.33	53
7	30.85	316	30.60	263	30.31	203	30.35	192	29.87	108	29.56	66	31.14	386	31.35	440	30.52	246	29.45	65	28.89	28	29.33	51
8	30.93	335	30.62	267	30.26	194	30.24	172	29.85	105	29.56	66	31.47	473	31.31	430	30.56	255	29.22	44	28.85	27	29.35	55
9	30.97	345	30.64	271	30.26	194	30.18	161	29.81	99	29.56	66	31.56	499	31.31	430	30.81	307	29.14	39	28.85	27	29.37	57
10	31.02	357	30.72	288	30.26	194	30.14	154	29.81	99	29.56	66	31.72	545	31.14	386	30.72	288	29.14	39	28.83	27	29.39	59
11	31.02	357	30.81	307	30.24	190	30.06	140	29.81	99	29.56	66	32.06	660	30.93	335	30.64	271	29.14	39	28.83	27	29.41	61
12	31.02	357	30.76	297	30.22	187	30.10	147	29.81	99	29.56	66	32.14	685	30.81	307	30.60	263	29.10	37	28.81	26	29.42	62
13	31.04	362	30.76	297	30.22	187	30.10	147	29.81	99	29.56	66	32.14	685	30.72	288	30.56	255	29.06	35	28.81	26	29.47	67
14	31.02	357	30.76	297	30.14	172	30.10	147	29.79	96	29.58	80	32.43	795	30.68	280	30.52	246	29.02	33	28.81	26	29.47	67
15	30.91	330	30.76	297	30.14	172	30.10	147	29.76	91	29.60	70	32.31	750	30.64	271	30.52	246	29.02	33	28.87	27	29.47	67
16	30.87	321	30.76	297	30.14	172	30.10	147	29.74	89	29.62	73	32.31	750	30.64	271	30.52	246	29.02	33	28.87	27	29.47	67
17	30.81	307	30.76	297	30.22	187	30.10	147	29.72	86	30.47	236	32.06	660	30.60	263	30.26	194	29.04	34	28.91	28	29.49	69
18	30.79	303	30.76	297	30.18	179	30.02	133	29.72	86	30.36	255	32.14	685	30.68	280	30.06	158	29.04	34	28.99	32	29.49	69
19	30.74	292	30.76	297	30.14	172	29.99	128	29.72	86	30.56	255	32.14	685	30.68	280	29.97	142	29.04	34	28.10	37	29.56	78
20	30.70	284	30.76	297	30.14	172	29.97	125	29.72	86	30.81	307	32.14	685	30.68	280	29.97	142	29.04	34	28.10	37	29.56	78
21	30.68	280	30.68	280	30.14	172	29.97	125	29.70	83	31.14	386	32.31	750	30.76	297	29.93	135	29.02	33	29.14	39	29.49	69
22	30.72	288	30.60	263	31.22	406	29.93	118	29.68	80	31.56	499	32.53	765	30.81	307	29.91	132	28.97	31	29.35	55	29.51	71
23	30.74	292	30.56	255	31.31	430	29.89	111	29.64	75	31.81	575	32.06	660	32.64	875	29.81	115	28.97	31	29.45	65	29.53	74
24	30.72	288	30.60	263	31.22	406	29.93	118	29.64	75	32.06	660	31.79	660	32.72	910	29.76	107	28.95	30	29.45	65	29.56	78
25	30.76	297	30.51	244	31.39	450	29.93	115	29.62	73	32.14	685	31.76	560	32.68	890	29.64	89	28.95	30	29.45	65	29.53	74
26	30.79	303	30.49	240	31.39	450	29.93	115	29.62	73	32.26	730	31.72	545	32.64	875	29.56	78	28.95	30	29.47	67	29.51	71
27	30.81	307	30.43	227	31.35	440	29.93	118	29.60	70	32.28	740	31.56	525	32.56	845	29.46	66	28.95	30	29.47	67	29.49	69
28	30.88	323	30.41	223	31.31	430	29.97	125	29.58	68	32.31	750	31.56	499	32.31	750	29.49	69	28.95	30	29.45	65	29.49	69
29	30.89	326	30.43	227	31.26	417	29.95	122	.....	.....	32.35	765	31.47	473	32.06	660	29.49	69	28.97	31	29.45	65	29.49	69
30	30.93	335	30.47	236	31.06	366	29.95	122	.....	.....	32.39	780	.....	.....	31.89	600	.....	.....	28.97	31	29.45	65	.....	.....
31	30.97	346	.....	.....	30.97	345	29.95	122	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28.97	31	29.45	65	.....	.....

**Monthly Discharge of Maganatawan River (North Branch) near Burk's
Falls for year ending Sept. 30th, 1919**

Drainage Area, 107 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	362	122	291	3.38	1.14	2.72	3.14
November ..	326	223	275	3.05	2.08	2.57	2.87
December ..	450	172	261	4.21	1.61	2.44	2.81
January (1919)	307	111	159	2.87	1.04	1.49	1.72
February	111	68	93	1.04	.64	.87	.91
March	780	64	294	7.29	.60	2.75	3.17
April	825	366	642	7.71	3.42	6.00	6.69
May	910	263	491	8.50	2.46	4.59	5.29
June	525	66	212	4.91	.62	1.98	2.21
July	69	30	41	.64	.28	.38	.44
August	67	26	40	.63	.24	.37	.43
September	78	51	65	.73	.48	.61	.68
The year	910	26	239	8.50	.24	2.24	30.35

Maganatawan River (South Branch) near Burk's Falls

Location—One-half mile south of Burk's Falls station, and 200 feet east of G.T. Ry. tracks on lot 8, concession 8, Township of Armour, Parry Sound District.

Records Available—Discharge measurements from June, 1915. Daily gauge heights from August 1, 1915.

Drainage Area—257 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, fastened to 2 x 8 scantling wedged between two hardwood trees on the left shore 200 feet above low water gauging station. Zero of the gauge (elev. 22.14 feet) is referred to a bench mark (elev. 35.00 feet) painted on top of a 5-ft. iron pipe located near the gauge on the north branch of the river, and a bench mark (elevation 29.77), which is the head of a nail driven horizontally in one of the trees to which gauge is fastened.

Channel and Control—Straight for about 250 feet above and 100 feet below to the rapids. The banks are high and wooded, and are not liable to overflow. The current is moderate.

Discharge Measurements—Made by wading with a small Price meter and from G.T.R. bridge, 1,500 feet below gauge.

Winter Flow—Relation of gauge height to discharge is but slightly affected by ice. Measurements are taken to determine the winter flow.

Regulation—Temporary dams above, which are used during log driving season, cause fluctuations at the gauge.

Accuracy—Rating curve only fairly well defined.

Observer—Henry Stroud, Burk's Falls.

Discharge Measurements of Maganatawan River (South Branch) near Burk's Falls for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 19	Ronald, F	79	476	.66	24.39	313 (a)
1919						
Feb. 1	"	71	117	2.56	24.31	300 (a)
Mar. 19	"	76	493	.74	24.47	363
Apr. 12	"	80	540	1.76	25.93	953
Apr. 14	"	85	584	1.83	26.06	1,067
May 21	"	80	525	1.23	25.31	647
June 11	"	85	488	1.19	25.14	580
July 10	"	72	81	2.15	23.78	174
Aug. 21	"	69	305	.44	23.64	133

(a) Ice measurement.

Daily Gauge Height in feet, and Discharge in second-feet, of Maganatawan River (South Branch) near Burk's Falls for year ending September 30th, 1919

Day	October			November			December			January			February			March			April			May			June			July			August			September		
	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.	Gauge Ht.	Dis- charge	Sec.-ft.			
1	23.81	182	550	24.81	443	443	24.85	455	455	24.39	321	258	25.56	740	26.10	1070	25.64	780	23.97	216	23.62	147	23.70	161	23.81	182	443	24.81	443	443	24.85	455	443	24.81	443	
2	23.85	190	555	24.85	455	455	24.85	455	455	24.39	321	253	25.64	780	26.06	1040	25.66	760	23.97	216	23.62	147	23.68	157	23.85	190	455	24.85	455	455	24.85	455	455	24.85	455	
3	23.89	198	565	24.87	461	461	24.85	455	455	24.39	321	248	25.60	760	26.06	1040	25.52	720	23.95	212	23.62	147	23.64	150	23.89	198	461	24.87	461	461	24.85	455	455	24.87	461	
4	23.97	216	555	24.87	461	461	24.85	455	455	24.37	316	243	25.60	760	26.06	1040	25.52	720	23.95	212	23.62	147	23.62	147	23.97	216	461	24.97	461	461	24.85	455	455	24.97	461	
5	24.81	443	525	24.85	455	455	24.83	449	449	24.35	311	240	25.64	780	25.97	985	25.43	680	23.97	216	23.62	147	23.62	147	24.81	443	443	24.81	443	443	24.85	455	455	24.81	443	
6	25.10	540	510	24.85	55	55	24.81	443	443	24.28	293	228	25.64	780	25.97	985	25.43	680	23.97	216	23.62	147	23.62	147	25.10	540	510	24.85	55	55	24.81	443	443	25.10	540	
7	25.10	540	510	24.83	449	449	24.72	416	416	24.26	288	221	25.64	780	25.97	985	25.43	680	23.97	216	23.62	147	23.62	147	25.10	540	510	24.83	449	449	24.72	416	416	25.10	540	
8	24.97	494	505	24.24	283	283	24.70	410	410	24.22	278	216	25.68	805	25.62	770	25.31	625	23.85	190	23.62	147	23.58	139	24.97	494	494	24.24	283	283	24.70	410	410	24.97	494	
9	24.89	467	510	24.18	268	268	24.64	392	392	24.24	283	216	25.72	805	25.56	740	25.39	660	23.81	182	23.60	143	23.56	136	24.89	467	467	24.18	268	268	24.64	392	392	24.89	467	
10	24.76	428	550	24.10	248	248	24.56	368	368	24.22	278	235	25.89	935	25.47	695	25.14	555	23.76	172	23.58	139	23.60	143	24.76	428	428	24.10	248	248	24.56	368	368	24.76	428	
11	24.64	392	552	24.08	243	243	24.52	356	356	24.20	273	214	25.89	935	25.47	695	25.14	555	23.76	172	23.58	139	23.60	143	24.64	392	392	24.08	243	243	24.52	356	356	24.64	392	
12	24.56	368	540	24.08	243	243	24.52	356	362	24.16	263	242	25.93	960	25.47	695	25.14	555	23.72	169	23.56	136	23.60	143	24.56	368	368	24.08	243	243	24.52	356	362	24.56	368	
13	24.60	380	535	24.14	258	258	24.56	368	362	24.14	258	242	25.93	960	25.47	695	25.14	555	23.72	165	23.54	132	23.58	139	24.60	380	380	24.14	258	258	24.56	368	362	24.60	380	
14	24.64	392	525	24.26	288	288	24.56	368	362	24.14	258	242	25.93	960	25.47	695	25.14	555	23.72	165	23.54	132	23.58	139	24.64	392	392	24.26	288	288	24.56	368	362	24.64	392	
15	24.68	404	525	24.31	301	301	24.47	342	342	24.16	263	242	25.93	960	25.47	695	25.14	555	23.72	161	23.54	132	23.47	120	24.68	404	404	24.31	301	301	24.47	342	342	24.68	404	
16	24.70	410	510	24.35	311	311	24.47	342	342	24.16	263	242	25.93	960	25.47	695	25.14	555	23.72	161	23.54	132	23.47	120	24.70	410	410	24.35	311	311	24.47	342	342	24.70	410	
17	24.72	416	510	24.37	316	316	24.49	347	347	24.22	278	235	25.93	960	25.47	695	25.14	555	23.72	161	23.54	132	23.47	120	24.72	416	416	24.37	316	316	24.49	347	347	24.72	416	
18	24.76	428	500	24.37	316	316	24.47	342	342	24.22	278	235	25.93	960	25.47	695	25.14	555	23.72	161	23.54	132	23.47	120	24.76	428	428	24.37	316	316	24.47	342	342	24.76	428	
19	24.81	443	494	24.39	321	321	24.43	332	332	24.33	306	247	26.35	1230	25.52	720	24.47	342	23.70	161	23.62	147	23.01	46	24.81	443	443	24.39	321	321	24.43	332	332	24.81	443	
20	24.79	437	494	24.39	321	321	24.43	332	332	24.35	311	246	26.39	1250	25.56	740	24.26	288	23.70	161	23.62	147	23.01	46	24.79	437	437	24.39	321	321	24.43	332	332	24.79	437	
21	24.76	428	488	24.43	332	332	24.41	327	327	24.37	316	241	26.47	1300	25.60	760	24.22	278	23.68	157	23.68	157	23.57	138	24.76	428	428	24.43	332	332	24.41	327	327	24.76	428	
22	24.79	437	474	24.81	443	443	24.41	327	327	24.35	311	241	26.47	1300	25.60	760	24.22	278	23.68	157	23.68	157	23.57	138	24.79	437	437	24.81	443	443	24.41	327	327	24.79	437	
23	24.81	443	455	24.97	494	494	24.39	321	321	24.33	306	247	26.40	1390	25.62	770	24.10	248	23.64	150	23.72	165	23.61	145	24.81	443	443	24.97	494	494	24.39	321	321	24.81	443	
24	24.83	449	455	25.14	555	555	24.41	327	327	24.31	301	247	26.39	1250	25.56	740	24.06	238	23.62	147	23.72	165	23.61	145	24.83	449	449	25.14	555	555	24.41	327	327	24.83	449	
25	24.85	455	443	25.22	590	590	24.43	332	332	24.28	293	245	26.31	1250	25.56	740	24.06	238	23.62	147	23.79	178	23.56	136	24.85	455	455	25.22	590	590	24.43	332	332	24.85	455	
26	24.89	467	443	25.22	590	590	24.47	342	342	24.26	288	251	26.31	1200	25.54	730	24.01	226	23.62	147	23.76	172	23.56	136	24.89	467	467	25.22	590	590	24.47	342	342	24.89	467	
27	24.95	488	476	25.18	570	570	24.45	337	337	24.24	283	253	26.31	1200	25.54	730	24.01	226	23.62	147	23.76	172	23.56	136	24.95	488	488	25.18	570	570	24.45	337	337	24.95	488	
28	24.97	494	416	24.72	416	416	24.43	327	327	24.18	268	253	26.26	1170	25.64	740	24.01	226	23.60	143	23.74	169	23.58	139	24.97	494	494	24.72	416	416	24.43	327	327	24.97	494	
29	25.02	510	428	25.16	565	565	24.41	327	327	24.18	268	253	26.26	1170	25.64	740	24.01	226	23.56	136	23.74	169	23.58	139	25.02	510	510	25.16	565	565	24.41	327	327	25.02	510	
30	25.04	520	476	25.06	525	525	24.39	321	321	24.18	268	253	26.26	1170	25.64	740	24.01	226	23.56	136	23.74	169	23.58	139	25.04	520	520	25.06	525	525	24.39	321	321	25.04	520	
31	25.06	525	488	25.06	525	494	24.39	321	321	24.18	268	253	26.26	1170	25.64	740	24.01	226	23.56	136	23.74	169	23.58	139	25.06	525	525	25.06	525	494	24.39	321	321	25.06	525	

Monthly Discharge of Maganatawan River (South Branch) near Burk's Falls for year ending September 30th, 1919

Drainage Area, 257 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October... (1918)	540	182	419	2.10	.71	1.63	1.88
November "	565	416	500	2.20	1.62	1.95	2.18
December "	590	243	407	2.30	.95	1.58	1.82
January .. (1919)	455	321	369	1.77	1.25	1.44	1.66
February	321	248	291	1.25	.96	1.13	1.18
March	715	216	377	2.78	.84	1.47	1.70
April	1,390	740	1,039	5.41	2.88	4.04	4.51
May	1,070	695	800	4.16	2.70	3.11	3.58
June	780	216	463	3.04	.84	1.80	2.01
July	228	123	170	.89	.48	.66	.76
August	178	132	151	.69	.51	.59	.68
September	161	46	128	.63	.18	.50	.56
The year	1,390	46	426	5.41	.18	1.66	22.50

Mississippi River at Appleton

Location—At the highway bridge in the Village of Appleton, between lots 3 and 4, concession 10, Township of Ramsay, County of Lanark.

Records Available—Discharge measurements from September, 1918, and gauge readings from September 20th, 1918.

Drainage Area—1,150 square miles.

Gauge—0 to 6 feet of standard gauge plates fastened to tree on right bank of river one-quarter mile above section.

Channel and Control—Channel is straight for 150 feet above and 350 feet below the section. The banks are fairly high and not liable to overflow. The bed of the river is composed of solid rock and will not shift. There are three channels formed by the bridge piers, at all stages. The Caldwell Woollen Mills dam is about 350 feet downstream.

Discharge Measurements—Made from the bridge with small Price current meter. Measurements are made by wading at bridge during low stages.

Winter Flow—Discharge relations affected by ice, particularly frazil ice.

Regulation—Storage dams for power and lumbering purposes are located on the upper part of the river.

Co-operation—The Mississippi River Improvement Co. co-operate in the maintenance of this section.

Observer—George Buchanan, Appleton.

Discharge Measurements of Mississippi River at Appleton for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 2	Ronald, F.	215	473	2.50	2.33	1,181 (a)
1919						
Jan. 20	"	215	382	3.41	2.04	1,301 (a)
Feb. 12	"	215	425	2.65	1.75	1,126 (a)
Mar. 6	"	215	421	2.70	1.79	1,008 (a)
" 27	"	215	638	5.77	3.73	3,689
April 28	"	215	641	5.81	3.75	3,724
May 7	"	215	684	5.53	3.67	3,782
" 31	"	215	734	8.40	4.92	6,166
June 10	Hatton, M.	215	684	6.20	3.96	4,239
" 19	Ronald, F.	215	490	5.32	2.87	2,605
July 26	Hatton, M.	215	468	1.21	1.33	568
Aug. 8	"	215	231	1.20	.92	278
Sept. 6	Ronald, F.	215	511	1.10	.35	564

(a) Ice measurement.

Monthly Discharge of Mississippi River at Appleton for year ending
September 30th, 1919

Drainage Area, 1,150 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October ... (1918)	1,020	326	716	.89	.28	.62	.72
November.	1,280	800	1,066	1.11	.70	.93	1.04
December .	1,840	950	1,339	1.60	.83	1.16	1.34
January ... (1919)	2,140	1,050	1,435	1.86	.91	1.25	1.44
February	1,300	650	930	1.13	.57	.81	.84
March	4,560	675	1,849	3.97	.59	1.61	1.86
April	4,960	3,590	4,188	4.31	3.12	3.64	4.06
May	6,510	3,500	4,225	5.66	3.04	3.67	4.23
June	5,880	1,020	2,987	5.11	.89	2.60	2.90
July	1,100	366	692	.96	.32	.60	.69
August	550	246	448	.48	.21	.39	.45
September	630	216	454	.55	.19	.39	.44
The year	6,510	216	1,694	5.66	.19	1.47	20.00

Mississippi River at Ferguson's Falls

Location—At the bridge on the road through the Village of Ferguson's Falls, near lots 16 and 17, concession 12 Township of Drummond, County of Lanark.

Records Available—Discharge measurements from July, 1915, and gauge readings from July 13, 1915.

Drainage Area—1,042 square miles.

Gauge—0 to 6 feet of standard gauge plates secured to the downstream side of second pier from the right bank. Zero of gauge 100.12.

Channel and Control—Channel is straight for 300 feet above and $\frac{1}{2}$ mile below the gauging station. The banks are not liable to overflow. There are, at present, 11 channels formed by old and new bridge piers. When the old piers are removed there will be 6 channels formed by new bridge piers. The present control is a short distance below the section, and ice action there will affect the discharge relation at low winter stages, but this will not be the point of control for high-water stages. At certain stages measurements are made 1,500 feet below bridge.

Winter Flow—Discharge relation is affected by ice.

Regulation—The river is regulated throughout its length by power and storage dams, as well as dams in connection with the timber industry.

Accuracy—Section is affected by piers of old bridge, which have not yet been removed.

Observer—A. M. Sheppard, Ferguson's Falls.

Discharge Measurements of Mississippi River at Ferguson's Falls for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 2.....	Ronald, F	242	403	2.66	101.85	1,071 (a)
1919						
Jan. 21.....	"	199	357	2.88	101.92	1,027 (a)
Feb. 12.....	"	188	328	2.10	101.67	690 (a)
Mar. 27.....	"	216	773	5.08	103.75	3,929 (b)
May 30.....	"	202	933	5.58	104.54	5,218
June 20.....	"	202	516	3.92	102.50	2,023
Sept. 7.....	"	221	263	1.51	101.27	397

(a) Ice measurement.

(b) Ice below section.

Daily Gauge Height in feet, and Discharge in second-feet, of Mississippi River at Ferguson's Falls for year ending
September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	101.25	405	101.81	920	101.94	1080	102.54	2060	101.92	935	101.58	585	103.87	4550	103.27	3420	104.21	5190	101.83	945	101.33	462	101.23	391
2	101.25	405	101.83	945	101.97	1110	102.44	1870	101.83	835	101.58	585	104.00	4790	103.29	3460	104.04	4870	101.78	899	101.33	462	101.23	391
3	101.25	405	101.83	945	101.97	1110	102.42	1830	101.79	790	101.58	585	103.79	4400	103.32	3520	103.88	4570	101.74	845	101.31	448	101.21	377
4	101.25	405	101.83	945	101.96	1100	102.35	1760	101.79	790	101.58	585	103.60	4040	103.33	3540	103.71	4250	101.71	810	101.31	448	101.21	377
5	101.27	419	101.83	945	101.92	1050	102.60	2170	101.78	780	101.58	585	103.48	3820	103.36	3590	103.56	3970	101.68	780	101.31	448	101.21	377
6	101.36	485	101.83	945	101.92	1050	102.82	2580	101.77	770	101.62	620	103.40	3670	103.40	3670	103.50	3860	101.67	730	101.31	448	101.19	364
7	101.45	555	101.83	945	101.92	1050	102.11	1300	101.75	750	101.65	650	103.35	3580	103.38	3630	103.50	3860	101.57	670	101.31	448	101.17	352
8	101.52	620	101.83	945	101.94	1080	102.17	1250	101.75	750	101.62	620	103.33	3540	103.38	3630	103.50	3860	101.55	650	101.31	448	101.17	352
9	101.60	700	101.84	960	101.96	1100	102.21	1250	101.72	720	101.67	670	103.40	3670	103.35	3580	103.50	3860	101.54	640	101.31	448	101.31	448
10	101.66	760	101.88	1010	102.00	1150	102.21	1300	101.71	710	101.67	670	103.54	3930	103.34	3560	103.44	3750	101.51	610	101.31	448	101.29	433
11	101.69	790	101.85	970	101.97	1110	102.42	1650	101.69	690	101.67	670	103.71	4250	103.33	3540	103.30	3480	101.49	590	101.31	448	101.26	412
12	101.69	790	101.83	945	101.80	910	102.48	1750	101.67	670	101.66	660	103.75	4330	103.38	3630	103.27	3420	101.45	555	101.29	433	101.23	391
13	101.70	800	101.81	920	101.77	875	102.64	2060	101.67	670	101.66	660	103.79	4400	103.40	3670	103.19	3270	101.42	530	101.29	433	101.21	377
14	101.72	820	101.80	910	101.85	970	102.17	1250	101.67	670	101.63	630	103.85	4510	103.42	3710	103.04	3000	101.40	515	101.29	433	101.19	364
15	101.69	790	101.78	890	101.99	1140	102.12	1180	101.65	650	101.65	650	103.88	4570	103.42	3710	102.92	2770	101.42	530	101.29	433	101.17	352
16	101.67	770	101.75	855	102.06	1230	101.98	1010	101.62	620	101.65	650	103.90	4610	103.42	3710	102.79	2520	101.42	530	101.29	433	101.14	354
17	101.63	730	101.74	845	102.06	1230	101.92	935	101.71	710	101.67	670	103.92	4650	103.42	3710	102.69	2340	101.42	530	101.29	433	101.17	352
18	101.61	710	101.77	875	102.08	1260	101.93	945	101.68	680	101.87	770	103.91	4630	103.39	3650	102.61	2190	101.42	530	101.29	433	101.14	354
19	101.58	680	101.82	935	102.13	1330	101.92	935	101.65	650	102.11	1040	103.88	4570	103.33	3540	102.50	1980	101.42	530	101.32	455	101.12	322
20	101.56	660	101.91	1040	102.13	1330	101.92	935	101.62	620	102.27	1250	103.87	4550	103.25	3380	102.44	1870	101.39	510	101.31	448	101.12	322
21	101.58	680	101.97	1110	102.17	1400	101.92	935	101.65	650	102.52	1650	103.83	4480	103.38	3630	102.35	1700	101.38	500	101.31	448	101.12	322
22	101.58	680	102.01	1160	102.22	1470	101.92	935	101.65	650	102.71	2000	103.83	4480	103.58	4000	102.27	1560	101.41	525	101.31	448	101.12	322
23	101.58	680	102.04	1210	102.25	1520	101.87	875	101.61	610	102.88	2320	103.71	4250	104.04	4870	102.22	1470	101.45	555	101.31	448	101.12	322
24	101.58	680	102.04	1210	102.29	1590	101.90	910	101.58	585	103.12	2770	103.54	3930	104.25	5270	102.18	1410	101.44	530	101.31	448	101.16	346
25	101.58	680	102.03	1190	102.24	1510	101.90	910	101.58	585	103.38	3250	103.50	3860	104.79	6270	102.12	1320	101.42	530	101.31	448	101.23	391
26	101.58	680	102.00	1150	102.46	1900	101.89	900	101.58	585	103.58	3630	103.44	3750	105.19	7020	102.07	1250	101.42	530	101.31	448	101.23	391
27	101.58	680	102.00	1150	102.58	2130	101.88	890	101.58	585	103.79	4020	103.36	3590	105.19	7020	101.97	1110	101.42	530	101.29	433	101.14	354
28	101.58	680	101.97	1110	102.42	1830	101.88	890	101.58	585	103.96	4340	103.33	3540	105.10	6860	101.91	1040	101.40	515	101.29	433	101.14	354
29	101.63	730	101.92	1050	102.42	1830	101.88	890	.....	.....	104.04	4500	103.30	3480	104.93	6540	101.90	1030	101.40	515	101.27	419	101.13	328
30	101.75	855	101.93	1070	102.44	1876	101.88	890	.....	.....	103.95	4700	103.29	3460	104.60	5920	101.85	970	101.38	500	101.25	405	101.12	322
31	101.79	900	.....	.....	102.46	1900	101.88	890	.....	.....	103.92	4650	.....	.....	104.40	5540	.....	.....	101.36	485	101.25	405	.....	.....

Monthly Discharge for Mississippi River at Ferguson's Falls for year ending September 30th, 1919

Drainage Area, 1,042 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	900	405	665	.87	.39	.64	.74
November "	1,210	845	1,003	1.16	.81	.96	1.07
December "	2,130	875	1,330	2.05	.84	1.28	1.48
January...(1919)	2,580	890	1,286	2.48	.85	1.23	1.42
February.....	935	585	689	.90	.56	.66	.69
March.....	4,700	585	1,666	4.51	.56	1.59	1.83
April.....	4,790	3,460	4,129	4.60	3.31	3.96	4.42
May.....	7,020	3,380	4,348	6.74	3.24	4.17	4.81
June.....	5,190	970	2,725	4.98	.93	2.62	2.92
July.....	945	485	602	.91	.47	.58	.67
August.....	462	405	442	.44	.39	.42	.48
September.....	448	322	363	.43	.31	.35	.39
The year.....	7,020	322	1,607	6.74	.31	1.54	20.90

Mississippi River at Galetta

Location—In the Village of Galetta, Township of Fitzroy, County of Carleton, about one hundred feet above, and parallel to the highway bridge over the river. It is only a few hundred yards below the dam and power house of the Galetta Power & Milling Company.

Records Available—Discharge measurements from June, 1915, and gauge readings twice daily from June 24, 1915.

Drainage Area—1,456 square miles.

Gauge—Gauge readings are secured by measuring to water surface with graduated staff, from B.M.—elev. 255.55—on bridge 5 feet north of left abutment.

Channel and Control—Channel is straight for 200 feet above and below the section to a little rapid. The river bed is composed of gravel and stones, with solid rock on the right bank and gravel on the left bank. The point of control is through a solid rock formation a hundred and fifty yards below the section.

Discharge Measurements—Made by wading and from a boat held up to tag line by cable. Extreme high-water measurements have to be made from the highway bridge.

Winter Flow—The winter conditions do not seriously affect the gauge height and discharge relations.

Regulation—The river is subject to regulation throughout its entire length. In the upper river are storage dams for power purposes, as well as timber dams for driving purposes.

Accuracy—Piers of old bridge which have not been removed will likely change curve.

Co-operation—Discharge measurements made at the bridge by the Department of Public Works of Canada.

Observer—F. Monteforte, Galetta.

Discharge Measurements of Mississippi River at Galetta for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 23.....	Hatton, M.....	120	390	3.71	246.88	1,446
Dec. 30.....	".....	110	450	4.10	247.59	1,846 (a)
1919						
Jan. 25.....	".....	105	241	3.26	245.63	786 (a)
Mar. 3.....	Ronald, F.....	87	158	3.14	244.88	500 (a)
" 3.....	".....	87	149	3.33	244.80	496 (a)
" 31.....	".....	112	1,021	5.31	250.55	5,426
" 31.....	".....	192	1,194	3.67	250.55	4,381 (b)
April 19.....	Hatton M.....	112	1,088	5.38	251.05	5,855
" 19.....	".....	192	1,316	3.84	251.05	5,164 (b)
May 31.....	Ronald, F.....	114	1,157	5.98	251.78	6,919
" 31.....	".....	192	1,360	4.66	251.78	6,331 (b)
June 24.....	".....	111	351	434	247.32	1,524
July 22.....	Hatton, M.....	95	176	374	244.65	659
Sept. 10.....	Ronald, F.....	95	184	370	244.77	681

(a) Ice measurement.

(b) Taken on highway bridge $\frac{1}{4}$ mile above regular section.

September 30th, 1919

[illegible]

**Monthly Discharge of Mississippi River at Galetta for the year ending
September 30th, 1919**

Drainage Area. 1,456 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October... (1918)	1,440	489	915	.99	.34	.63	.73
November "	1,600	965	1,235	1.10	.66	.85	.95
December "	2,070	805	1,348	1.42	.55	.93	1.07
January (1919)	1,460	755	1,134	1.00	.52	.78	.90
February	925	530	690	.64	.36	.47	.49
March	5,460	505	2,023	3.75	.35	1.39	1.60
April	6,030	3,570	4,438	4.14	2.45	3.05	3.40
May	7,330	3,200	4,481	5.03	2.20	3.08	3.55
June	6,130	875	2,696	4.21	.60	1.85	2.06
July	935	411	598	.64	.28	.41	.47
August	462	276	392	.32	.19	.27	.31
September	600	249	392	.41	.17	.27	.30
The year	7,330	249	1,698	5.03	.17	1.17	15.88

Mississippi River near Snow Road

Location—At the highway bridge about two miles below the Village of Snow Road, Township of Sherbrooke, County of Lanark.

Records Available—Discharge measurements from July, 1915, and gauge readings on week days since July 30, 1915.

Drainage Area—446 square miles.

Gauge—0 to 6 ft. of standard gauge plates secured vertically to the downstream side of the right abutment of the highway bridge. The elevation of the zero on gauge is assumed as 100.00.

Channel and Control—The channel approaches and leaves the section at a slight angle. The banks are high, and are not liable to overflow. The bridge pier forms two channels at the gauging section. Earth, rocks and gravel in the river bed, not shifting. Control for ordinary stages not well defined. At very high water stages the point of control is probably the head of the rapids just above High Falls.

Discharge Measurements—Measurements made from bridge at all stages.

Winter Flow—Discharge relation affected by ice.

Regulation—The power and lumber companies operating on this river have storage dams above this point.

Accuracy—No Sunday readings have been secured by gauge-readers, but the fluctuation in stage is slow. The open-water relation should be good.

Observer—W. J. Jackson, Snow Road.

Discharge Measurements of Mississippi River near Snow Road for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 26.....	Ronald, F.....	58	343	1.06	102.46	365 (a)
1919						
Jan. 16.....	"	59	373	1.54	103.02	575 (a)
Jan. 16.....	"	59	373	1.34	103.02	507(a)(b)
Mar. 5.....	"	58	348	.88	102.58	305 (a)
Apr. 2.....	"	58	476	3.66	104.75	1,746
" 30.....	"	68	459	3.38	104.50	1,549
May 30.....	"	68	545	4.43	106.04	2,412
Aug. 7.....	Hatton, M.....	58	327	1.14	102.35	374
Sept. 7.....	Ronald, F.....	58	313	.85	102.17	265
" 7.....	"	58	313	.78	102.17	244

(a) Ice measurement.

(b) .2 and .8 method used for part of this measurement, but .6 as used in preceding measurement considered better.

Daily Gauge Height in feet, and Discharge in-second-feet, of Mississippi River near Snow Road for year ending
September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-
	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	102.04	234	102.33	322	.....	380	103.31	690	102.81	382	102.52	287	104.25	1340	104.50	1540	.....	2840	102.67	443	102.50	378	102.29	309
2	102.00	224	102.33	322	102.58	408	103.31	690	.....	378	.....	303	104.75	1760	104.58	1610	105.58	2590	102.58	408	102.50	378	102.27	303
3	102.00	224	.....	322	102.60	416	103.29	680	102.79	375	102.52	319	104.58	1610	104.75	1760	105.50	2500	102.50	378	.....	353	102.25	296
4	102.02	229	102.33	322	102.62	424	103.31	690	102.77	368	102.50	312	103.83	1050	.....	1840	105.42	2410	102.46	365	102.35	328	102.25	296
5	102.04	234	102.31	315	102.62	424	.....	690	102.67	335	102.50	312	104.25	1340	104.92	1920	105.17	2150	102.42	352	102.35	328	102.25	296
6	.....	288	102.29	309	102.62	424	103.31	690	102.65	328	102.50	345	.....	1410	104.58	1610	105.00	1990	.....	365	102.35	328	102.25	296
7	102.33	322	102.29	309	102.67	443	103.31	690	102.62	319	102.50	352	104.42	1480	104.79	1800	104.82	1830	102.50	378	102.33	322	.....	296
8	102.35	328	102.27	303	.....	443	103.21	640	102.58	306	102.52	355	104.50	1540	104.58	1610	.....	1840	102.46	365	102.33	322	102.25	296
9	102.35	328	.....	300	102.67	443	103.21	640	.....	300	.....	358	104.67	1690	104.50	1540	104.83	1840	102.42	352	102.33	322	102.25	296
10	102.38	338	.....	300	102.67	443	103.17	620	102.54	293	102.54	358	104.67	1690	104.50	1540	104.67	1690	102.50	378	.....	322	102.25	296
11	102.38	338	102.25	296	102.67	443	103.17	575	102.54	293	102.54	358	104.92	1920	.....	1690	104.50	1540	102.50	378	102.33	322	102.21	284
12	102.25	296	102.25	296	102.69	451	.....	560	102.58	306	102.56	401	105.08	2060	104.83	1840	104.38	1440	102.46	365	102.33	322	102.21	284
13	.....	302	102.31	315	102.71	459	103.10	540	102.62	319	102.54	393	.....	2020	104.75	1760	104.25	1340	.....	365	102.33	322	102.21	284
14	102.29	309	102.29	309	102.73	468	103.10	540	102.65	328	102.52	386	105.00	1990	104.58	1610	104.08	1230	102.46	365	102.33	322	.....	278
15	102.25	296	102.23	290	.....	504	103.08	530	102.65	328	102.50	378	105.00	1990	104.58	1610	.....	1200	102.50	378	102.33	322	102.17	272
16	102.27	303	102.21	284	103.00	540	103.00	497	.....	324	.....	393	104.92	1920	104.46	1510	104.00	1170	102.50	378	102.33	322	102.17	272
17	102.29	309	.....	290	103.10	585	103.00	497	102.62	319	102.58	408	104.87	1870	104.42	1480	104.08	1230	102.50	378	.....	325	102.12	256
18	102.29	309	102.25	296	103.17	620	103.00	497	102.62	319	102.75	476	105.08	2060	.....	1480	104.00	1170	102.50	378	102.35	328	102.12	256
19	102.25	296	102.27	303	103.19	630	.....	497	102.58	306	102.92	550	105.17	2150	104.42	1480	103.83	1050	102.50	378	102.35	328	102.12	256
20	.....	306	102.33	322	103.19	630	103.00	497	102.54	293	103.33	710	.....	2040	104.33	1400	103.71	975	.....	378	102.33	322	102.00	224
21	102.31	315	102.42	352	103.19	630	102.96	480	102.54	293	104.00	1170	104.92	1920	104.50	1540	103.53	870	102.50	378	102.33	322	.....	224
22	102.29	309	102.58	408	.....	670	102.96	480	102.54	293	103.67	950	104.83	1840	105.17	2150	.....	760	102.50	378	102.33	322	.....	224
23	102.29	309	102.56	401	103.35	710	102.92	465	.....	300	.....	1140	104.75	1760	106.08	3180	103.12	645	102.46	365	102.33	322	102.00	224
24	102.31	315	.....	397	103.35	710	102.90	453	102.58	306	104.21	1320	104.67	1690	106.17	3280	103.00	585	102.46	365	102.33	322	102.00	224
25	102.29	309	102.54	393	103.35	710	102.88	447	102.54	293	104.33	1400	104.67	1690	.....	3320	102.92	550	102.50	378	102.33	322	101.96	214
26	102.29	309	102.46	365	103.33	700	.....	435	102.52	287	104.83	1840	104.62	1630	.....	3490	102.83	510	102.50	378	102.33	322	101.94	208
27	.....	282	102.44	358	103.33	700	102.92	424	102.50	281	105.33	2310	.....	1630	.....	3400	102.83	510	.....	378	102.33	322	101.94	208
28	102.12	256	102.46	365	103.33	700	102.88	408	102.50	281	105.50	2500	104.58	1610	.....	3450	102.75	476	102.50	378	102.33	322	.....	208
29	102.08	245	102.44	358	.....	700	102.85	397	.....	.....	105.58	2590	104.58	1610	.....	3320	.....	468	102.46	365	102.33	322	101.94	208
30	102.25	296	102.42	352	103.33	700	102.83	389	.....	.....	106.00	1580	104.54	1580	.....	3200	102.71	459	102.46	365	102.33	322	101.94	208
31	102.33	322	.....	....	103.33	700	102.83	389	.....	.....	104.25	1340	.....	....	106.00	3080	.....	....	102.50	378	.....	315	.....	....

Note—May 25th to 30th—Water above gauge—estimated high water, 106.33.

Monthly Discharge of Mississippi River near Snow Road for year
ending September 30th, 1919

Drainage Area, 446 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October ..(1918)	338	224	293	.76	.50	.66	.76
November “	408	284	329	.91	.64	.74	.83
December “	710	389	555	1.59	.85	1.24	1.43
January ..(1919)	690	389	539	1.55	.87	1.21	1.40
February	382	281	316	.86	.63	.71	.74
March	2,590	287	848	5.81	.64	1.90	2.19
April	2,150	1,050	1,723	4.82	2.35	3.87	4.32
May	3,490	1,400	2,141	7.83	3.14	4.80	5.53
June.....	2,840	459	1,329	6.37	1.03	2.98	3.32
July	443	352	375	.99	.79	.84	.97
August	378	315	327	.85	.70	.73	.84
September	309	208	258	.69	.47	.58	.65
The year	3,490	208	754	7.83	.47	1.69	22.94

Moira River near Foxboro

Location—Three hundred feet above G.T.R. Crossing, and six hundred feet east of Foxboro Station, on the G.T.R.-Belleville, Peterboro Branch. Near lot 5, concession VI, Township of Thurlow, County of Hastings.

Records Available—Monthly discharge measurements from September, 1915, and gauge readings from October 12, 1915.

Drainage Area—1,038 square miles.

Gauge—A boxed chain gauge on the right bank of the river against a tree 400 feet above section. When the gauge reads zero the elevation of the water is 320.46.

Channel and Control—At one side of the river at the section are boulders and rocks, but the rest of the section is smooth, solid rock, liable to no movement at all. The control is only a few feet below the section and is not likely to freeze over in winter except for short periods of time.

Discharge Measurements—At ordinary stages the measurements are made by wading, at tag line. At high water measurements are made by boat at a point opposite the gauge, or at second bridge below section.

Winter Flow—The relation of gauge height to discharge is but slightly affected by ice, and in a fairly uniform manner throughout the winter.

Regulation—The river above the section has dams in many places besides the regulation for the lumber interest, on different tributary lakes and streams.

Accuracy—Open water relation will be good.

Observer—C. Stewart, Foxboro P.O.

Discharge Measurements of Moira River near Foxboro for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Feb. 7.....	Hatton, M.....	156	310	2.14	322.79	662.(a)
" 13.....	Ronald, F.....	155	279	1.74	322.63	484 (a)
Mar. 12.....	".....	171	373	2.53	323.08	943 (a)
" 25.....	".....	287	2,022	3.03	326.58	6,122 (b)
April 17.....	".....	287	1,484	2.10	324.85	3,122 (b)
May 16.....	".....	287	1,435	2.60	324.94	3,731
July 3.....	".....	162	273	1.58	322.36	431
Aug. 15.....	Hatton, M.....	160	149	.60	321.67	88
Sept. 14.....	Ronald, F.....	144	107	.36	321.36	38

(a) Ice measurement.

(b) Taken 2 miles below gauge.

Monthly Discharge of Moira River near Foxboro for year ending
September 30th, 1919

Drainage Area, 1,038 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918) ..	945	262	551	.91	.25	.53	.61
Nov. " ..	1,690	945	1,351	1.63	.91	1.30	1.45
Dec. " ..	2,600	1,030	1,782	2.50	.99	1.72	1.98
Jan. (1919)	2,580	815	1,281	2.49	.79	1.23	1.42
Feb. " ..	800	250	501	.77	.24	.48	.50
March " ..	5,840	364	2,755	5.63	.35	2.65	3.06
April " ..	4,200	2,350	3,540	4.05	2.26	3.41	3.80
May " ..	5,930	2,330	3,557	5.71	2.24	3.42	3.94
June " ..	3,480	565	1,400	3.35	.54	1.35	1.51
July " ..	540	148	299	.52	.14	.29	.33
Aug. " ..	164	102	129	.16	.10	.12	.14
Sept. " ..	106	56	79	.10	.05	.08	.09
The year.....	5,930	56	1,441	5.71	.05	1.39	18.84

Muskoka River (South Branch) at Black's Bridge

Location—At the highway bridge known as Black's Bridge, about five and one-half miles east of the Town of Bracebridge and two and one-half miles east of the Hydro-Electric Power Commission's plant at South Falls.

Records Available—High water measurements have been taken here since April 24th, 1915, in conjunction with the Tretheway's Falls section which has been discontinued, gauge heights from June 4th, 1918.

Drainage Area—668 square miles.

Gauge—Twelve feet of standard gauge plates secured vertically to the downstream corner of right abutment. Zero of gauge (elevation 85.69) is referred to a bench mark (elevation 99.65) painted on downstream corner of right abutment, and also to a bench mark (elevation 100.17) which is the head of a nail driven horizontally in a telephone pole one hundred feet downstream from right abutment. Head of nail is about five feet above ground and is plainly marked by painted arrow.

Channel and Control—The channel is straight for about 150 feet above and 100 feet below section. Both banks are liable to overflow. Point of control is not clearly defined. Bed of stream is composed of sand. As the velocity is not high at any stage this is not liable to shift. At low stages there are three channels and at high stages five, these being formed by the bridge piers.

Discharge Measurements—Made from the bridge at high and ordinary stages with small Price meter. At low stages measurements are made at the Matthiasville bridge, two miles above.

Winter Flow—Owing to the somewhat sluggish flow, ice will likely form to a great thickness. During the winter months, measurements will be made at the low water section.

Regulation—The Provincial Department of Public Works operate the dam at Baysville controlling the run off from most of the drainage area.

Accuracy—A fairly well defined curve has been established here.

Observer—Wesley Morrow, Muskoka Falls P.O.

Discharge Measurements at Muskoka River (South Branch) at Black's Bridge for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Oct. 10.....	Ronald, F.....	89	1,352	.40	90.86	547
Dec. 17.....	".....	97	1,449	.67	91.77	967
1919						
Feb. 2.....	".....	89	1,459	.62	91.94	1,001 (a)
" 18.....	".....	45	258	3.90	91.02	1,007 (a)
Mar. 19.....	".....	96	1,491	.75	92.27	1,125(a)(b)
April 12.....	".....	104	1,691	1.34	94.25	2,260
May 20.....	".....	104	1,539	1.04	92.77	1,603
July 9.....	".....	94	1,499	.74	92.06	1,112
Aug. 20.....	Hatton, M.....	39	151	1.93	89.94	291
" 20.....	".....	41	139	2.27	89.94	316
Sept. 24.....	Ronald, F.....	39	118	2.00	89.86	237

(a) Ice measurement.

(b) Log boom above section.

Daily Gauge Height in feet, and Discharge in second-feet, of Muskoka River (South Branch) at Black's Bridge for
year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	90.11	369	92.36	1200	92.11	1100	92.27	1170	92.02	1070	90.94	655	93.19	1600	94.19	2200	95.19	3020	93.69	1880	89.86	290	89.94	315
2	90.11	369	92.36	1200	92.11	1100	92.27	1170	91.98	1050	90.94	655	93.19	1600	93.77	1930	94.19	2200	92.27	1170	90.11	369	89.94	315
3	90.11	369	92.36	1200	92.11	1100	92.27	1170	91.90	1020	90.94	655	93.19	1600	93.77	1930	94.86	2720	92.27	1170	90.11	369	89.86	290
4	90.11	369	92.44	1240	92.11	1100	92.36	1200	91.86	1000	90.94	655	93.36	1690	93.77	1930	93.36	1690	92.27	1170	90.11	369	89.86	290
5	90.36	451	92.44	1240	92.11	1100	92.86	1440	91.86	1000	90.94	655	93.36	1690	93.69	1880	93.19	1600	92.27	1170	90.02	340	89.86	290
6	90.94	655	92.44	1240	92.19	1140	92.36	1200	91.86	1000	90.94	655	93.36	1690	93.69	1880	93.19	1600	92.27	1170	89.94	315	89.94	315
7	90.94	655	92.44	1240	92.11	1100	92.40	1220	91.86	1000	90.94	655	93.52	1780	93.69	1880	93.19	1600	92.27	1170	89.86	290	89.86	290
8	91.02	680	92.44	1240	92.11	1100	92.44	1240	91.77	970	90.94	655	93.61	1840	93.69	1880	93.19	1600	92.11	1100	89.69	239	89.69	239
9	91.19	740	92.44	1240	92.11	1100	92.52	1270	91.77	970	90.94	655	93.69	1880	93.77	1930	93.27	1640	91.77	970	89.69	239	89.69	239
10	91.36	805	92.44	1240	92.52	1270	92.52	1270	91.69	935	90.94	655	93.86	1990	93.71	1900	93.11	1560	91.52	870	89.61	215	89.90	302
11	91.36	805	92.44	1240	92.52	1270	92.69	1360	91.69	935	90.94	655	94.02	2080	93.71	1900	93.11	1560	91.52	870	89.61	215	89.86	290
12	91.69	935	92.44	1240	92.69	1360	92.19	1140	91.69	935	90.94	655	94.19	2200	93.52	1780	92.86	1440	91.19	740	89.61	215	89.86	290
13	91.69	935	92.94	1480	91.69	935	92.19	1140	91.44	835	90.94	655	94.19	2200	93.36	1690	92.69	1360	90.94	655	89.52	188	89.86	290
14	91.77	970	93.44	1730	92.02	1070	92.52	1270	91.36	805	90.94	655	94.19	2200	93.19	1600	92.52	1270	91.02	680	89.69	239	89.77	263
15	91.77	970	93.61	1880	91.94	1040	92.19	1140	91.02	680	90.94	655	94.44	2380	93.02	1520	92.44	1240	91.27	770	89.77	263	89.86	290
16	91.86	1000	93.69	1880	91.77	970	92.19	1140	91.02	680	90.94	655	94.69	2580	92.86	1440	92.27	1170	91.36	805	89.86	290	89.86	290
17	91.86	1000	93.36	1690	91.77	970	92.19	1140	91.02	680	91.19	740	94.94	2800	92.77	1400	92.19	1140	91.27	770	90.11	369	89.77	263
18	91.94	1040	93.19	1600	91.73	950	92.19	1140	91.02	680	92.03	1070	94.94	2800	92.69	1360	92.19	1140	91.26	765	90.11	369	89.77	263
19	91.94	1040	92.69	1360	91.69	935	92.15	1120	91.02	680	92.27	1170	95.19	3020	92.69	1360	92.27	1170	91.36	805	90.27	420	89.77	263
20	92.02	1070	92.36	1200	91.86	1000	92.19	1140	91.02	680	92.52	1270	95.19	3020	92.86	1440	92.44	1240	91.36	805	90.27	420	89.77	263
21	92.11	1100	92.36	1200	92.02	1070	92.19	1140	90.94	655	92.61	1310	95.44	3250	92.86	1440	92.44	1240	91.69	935	90.11	369	89.77	263
22	92.11	1100	92.27	1170	92.11	1100	92.19	1140	90.94	655	92.61	1310	95.44	3250	93.19	1600	92.51	1260	90.02	340	89.77	263	89.77	263
23	92.19	1140	92.19	1140	92.11	1100	92.19	1140	90.94	655	92.61	1310	95.44	3250	93.19	1600	92.69	1360	90.02	340	89.77	263	89.77	263
24	92.27	1170	92.19	1140	92.11	1100	92.19	1140	90.94	655	92.69	1360	95.36	3170	93.69	1880	92.44	1240	89.86	290	90.02	340	89.86	290
25	92.27	1170	92.19	1140	92.11	1100	92.27	1170	90.94	655	93.19	1600	95.44	3250	94.86	2720	92.27	1170	89.94	315	90.02	340	89.86	290
26	92.27	1170	92.27	1170	92.19	1140	92.27	1170	90.94	655	93.19	1600	95.44	3250	94.86	2720	92.27	1170	90.02	340	90.02	340	89.86	290
27	92.27	1170	92.11	1100	92.27	1170	92.19	1140	90.94	655	93.36	1690	95.19	3020	95.27	3090	92.69	1360	90.11	369	89.94	315	89.86	290
28	92.27	1170	92.19	1140	92.27	1170	92.19	1140	90.94	655	93.44	1730	95.11	2950	95.36	3170	93.61	1840	90.11	369	89.94	315	89.81	275
29	92.27	1170	92.27	1170	92.27	1170	92.19	1140	90.94	655	93.52	1780	94.86	2720	95.36	3170	93.52	1780	90.02	340	89.94	315	89.86	290
30	92.36	1200	92.11	1100	92.36	1200	92.11	1100	.....	.....	93.52	1780	94.61	2530	95.27	3090	93.52	1780	89.69	239	89.86	290	89.86	290
31	92.36	1200	.....	.....	92.27	1170	92.06	1080	.....	.....	93.36	1690	.....	.....	95.23	3060	.....	.....	89.86	290	89.87	293	.....	.....

**Monthly Discharge of Muskoka River (South Branch) at Black's Bridge,
for year ending September 30th, 1919**

Drainage Area, 668 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	1,200	369	901	1.80	.55	1.35	1.56
November "	1,880	1,100	1,301	2.81	1.65	1.95	2.18
December "	1,360	935	1,104	2.04	1.40	1.65	1.90
January (1919)	1,440	1,080	1,179	2.16	1.62	1.76	2.03
February	1,070	655	816	1.60	.98	1.22	1.27
March	1,780	655	1,026	2.66	.98	1.54	1.78
April	3,250	1,600	2,440	4.87	2.40	3.65	4.07
May	3,170	1,360	1,995	4.75	2.04	2.99	3.45
June	3,020	1,140	1,540	4.52	1.71	2.31	2.58
July	1,880	239	770	2.81	.36	1.15	1.33
August	420	188	310	.63	.28	.46	.53
September	315	116	276	.47	.17	.41	.46
The year	3,250	116	1,138	4.87	.17	1.70	23.11

Muskoka River (North Branch) near Port Sydney

Location—At the highway bridge near the Village of Port Sydney and $\frac{1}{4}$ mile below Mary Lake, on lot 25, concession 5, Township of Stephenson, Muskoka District.

Records Available—Discharge measurements from April, 1915. Daily gauge heights from April 16, 1915.

Drainage Area—560 square miles.

Gauge—Vertical steel staff with enamelled face graduated in feet and inches and fastened to abutment on left upstream side of bridge. Zero of gauge (elev. 7.03 feet) is referred to a bench mark (elev. 24.78 feet) painted on top of right abutment, downstream side, and a bench mark (elevation 17.71), painted on side of right abutment, upstream side.

Channel—Straight for about 1,500 feet above and 500 feet below gauging station. Both banks are high, wooded, and not liable to overflow. The bed of the channel is composed of gravel and rock.

Discharge Measurements—Made from highway bridge with a small Price current meter.

Winter Flow—Open water conditions throughout the year.

Regulation—The operation of dam at Mary Lake during certain periods of the year causes fluctuation at the gauge.

Accuracy—The rating curve is well defined, and estimates of discharge are good.

Observer—Donald McClure, Port Sydney.

Discharge Measurements of Muskoka River (North Branch) near Port Sydney for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Oct. 10.....	Ronald, F.....	55	337	3.37	9.37	1135
Dec. 18.....	".....	54	339	3.00	9.32	1018
1919						
Feb. 3.....	".....	51	316	2.15	8.86	678
Mar. 18.....	".....	56	359	4.03	9.70	1627
Apr. 15.....	".....	58	450	5.06	11.24	2563
May 21.....	".....	55	342	3.07	9.30	1051
June 10.....	".....	53	336	2.22	9.23	845
July 9.....	".....	48	273	.72	7.99	197
Aug. 21.....	Hatton, M.....	52	302	1.61	8.51	486
Sept. 25.....	Ronald, F.....	55	348	3.42	9.45	1179

Daily Gauge Height in feet, and Discharge in second-feet, of Muskoka River (North Branch) near Port Sydney for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	7.83	148	9.08	885	9.20	970	9.78	1400	8.86	730	8.58	384	10.76	2170	9.61	1270	10.20	1740	7.99	225	7.74	114	7.86	162
2	7.83	148	8.99	825	9.20	970	9.78	1400	8.86	730	.....	390	10.78	2180	9.72	1360	10.09	1650	7.99	225	7.70	100	7.86	162
3	7.83	148	8.99	825	9.20	970	9.78	1400	8.86	730	.....	395	10.70	2120	10.82	2220	9.07	880	7.99	225	7.70	100	7.86	162
4	8.49	500	8.99	825	9.20	970	9.70	1340	8.86	730	.....	400	10.99	2350	10.59	2030	9.51	1190	8.09	280	7.78	128	7.86	162
5	9.08	885	8.74	650	9.20	970	9.61	1270	8.82	705	.....	405	10.97	2340	10.51	1970	9.05	865	8.09	280	7.86	162	7.86	162
6	9.38	1240	8.74	650	9.03	850	9.61	1270	8.81	695	.....	411	10.86	2250	10.57	2020	9.11	910	8.05	258	7.76	121	7.86	162
7	9.99	1570	8.58	550	9.03	850	9.53	1200	8.78	675	.....	417	10.65	2080	10.24	1760	9.11	910	8.05	258	7.74	114	7.86	162
8	9.99	1570	8.74	1370	9.03	850	8.86	730	8.78	675	.....	423	10.57	2020	10.32	1820	9.13	920	7.99	225	7.74	114	7.90	180
9	9.24	1000	9.74	1370	9.03	850	8.86	730	8.78	675	.....	428	10.65	2080	10.34	1830	9.13	920	7.99	225	7.74	114	7.90	180
10	9.24	1000	10.08	1640	9.03	850	8.78	675	8.78	675	8.41	456	10.80	2200	10.43	1900	9.05	865	7.99	225	7.74	114	7.95	205
11	9.33	1060	9.24	1000	9.03	850	8.78	675	8.76	660	8.41	456	11.24	2550	10.24	1760	8.82	705	7.99	225	7.74	114	7.95	205
12	9.33	1060	9.24	1000	9.03	850	8.78	675	8.74	650	8.41	456	11.40	2680	9.95	1540	8.74	650	7.99	225	7.74	114	7.95	205
13	9.41	1120	9.24	1000	9.11	905	8.78	675	8.91	765	8.70	620	11.28	2580	9.40	1110	7.99	725	7.93	195	7.74	114	7.82	144
14	9.41	1120	9.24	1000	9.11	905	8.78	675	8.65	590	9.11	905	11.26	2570	9.32	1050	7.88	171	7.88	171	7.76	121	7.78	128
15	9.33	1060	9.24	1000	9.03	850	8.78	675	8.70	620	9.05	865	11.24	2550	9.34	1070	7.86	162	7.93	195	7.78	128	7.91	185
16	9.33	1060	9.24	1000	9.03	850	8.78	675	8.68	610	9.07	880	11.30	2600	9.13	920	8.36	428	7.88	171	7.78	128	7.91	185
17	9.33	1060	9.24	1000	9.03	850	8.78	675	8.63	589	9.09	895	11.31	2910	9.51	1190	8.57	545	7.86	162	7.78	128	7.91	185
18	9.33	1060	9.24	1000	9.03	850	8.78	675	8.65	590	9.51	1190	12.36	3430	8.97	810	8.53	520	7.86	162	7.85	158	7.91	185
19	8.91	765	9.24	1000	9.03	850	8.78	675	8.65	590	9.50	1180	12.20	3300	9.72	1360	8.32	406	7.86	162	8.03	246	7.91	185
20	8.74	650	9.24	1000	9.03	850	8.78	675	8.63	580	10.28	1790	12.07	3200	9.57	1240	8.28	384	7.74	114	8.22	351	8.03	246
21	8.74	650	9.08	885	9.45	1150	8.95	795	8.59	555	10.59	2030	11.86	3030	9.32	1050	8.05	258	7.74	114	8.61	565	8.03	246
22	8.58	550	9.08	885	9.45	1150	8.95	795	8.61	565	10.53	1980	11.76	2950	9.32	1050	8.01	236	7.74	114	8.85	725	9.74	650
23	9.33	1060	8.91	765	9.36	1080	8.95	795	8.61	565	10.36	1850	10.51	1970	9.78	1400	7.99	225	7.74	114	8.43	466	9.61	1270
24	9.33	1060	8.91	765	9.36	1080	8.86	730	8.61	565	10.44	1910	10.63	2060	10.30	1800	7.99	225	7.74	114	8.43	466	9.61	1270
25	9.08	885	8.91	765	10.20	1740	8.86	730	8.34	417	10.49	1950	11.59	2830	11.01	2370	8.03	246	7.74	114	8.28	384	9.43	1130
26	8.99	825	9.08	885	10.20	1740	8.86	730	8.15	312	10.63	1980	11.72	2920	11.24	2450	8.21	346	7.85	158	7.88	171	9.30	1040
27	8.99	825	9.08	885	10.20	1740	8.86	730	8.20	340	10.61	2050	11.55	2800	11.11	2450	8.36	428	7.86	162	7.86	162	8.98	815
28	8.99	825	9.08	885	10.20	1740	8.86	730	8.24	362	11.24	2550	11.45	2720	10.59	2030	8.15	312	7.86	162	7.86	162	8.46	483
29	9.33	1060	9.08	885	9.86	1470	9.03	850	.....	.....	11.18	2500	11.28	2660	10.53	1980	7.99	225	7.86	162	7.86	162	8.28	384
30	9.33	1060	9.08	885	9.86	1470	8.86	730	.....	.....	10.71	2130	10.36	1850	10.65	2080	7.99	225	7.86	162	7.86	162	8.07	268
31	9.33	1060	.....	.....	9.78	1400	8.86	730	.....	.....	10.65	2080	.....	.....	10.51	1970	.....	.....	7.86	162	.....	.....	.....	.....

**Monthly Discharge for Muskoka River (North Branch) at Port
Sydney for year ending September 30th, 1919**

Drainage Area, 560 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	1570	148	906	2.80	.28	1.62	1.87
November	1640	550	921	2.93	.98	1.64	1.83
December	1740	850	1164	3.11	1.52	2.08	2.40
January (1919)	1400	675	861	2.50	1.21	1.54	1.78
February	850	312	609	1.52	.56	1.09	1.14
March	2550	384	1173	4.55	.69	2.09	2.41
April	3430	1850	2532	6.12	3.30	4.52	5.04
May	2550	810	1644	4.55	1.45	2.94	3.39
June	1740	162	592	3.11	.29	1.06	1.18
July	280	114	185	.50	.20	.33	.38
August	725	100	210	1.29	.18	.38	.44
September	1320	128	370	2.36	.23	.66	.74
The year	3430	100	931	6.12	.18	1.66	22.57

Napanee River near Napanee

Location—At Mink's Bridge, three miles above Napanee, near lot 1, concession 1, Township of Camden, County of Addington.

Records Available—Discharge measurements from August, 1915, and gauge readings from September 8, 1915.

Drainage Area—300 square miles.

Gauge—A boxed chain gauge on the right bank of the river 400 feet above the section. Nine feet of standard gauge plates. When the gauge reads zero the elevation of the water is 97.93. Three feet of standard gauge plates secured to 2 x 6 scantling fastened to tree 10 feet west of chain gauge. This is used for extreme high water.

Channel and Control—The channel is curved above the section to within 20 feet of the bridge, and is straight for 300 feet below. The right bank is high, while the left is comparatively low and liable to overflow. The bed of the stream is composed of rocks and gravel, not likely to shift.

Discharge Measurements—Made by wading at low stages and from bridge at high stages.

Winter Flow—Relation of gauge height to discharge is affected by ice.

Regulation—There are several power developments on the upper part of the river, and also lumber dams on tributary waters.

Accuracy—Two daily readings give only fair mean daily gauge heights.

Observer—Mrs. Dan. O'Shaughnessy, Napanee.

Discharge Measurements of Napanee River near Napanee for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 15.....	Ronald, F.....	64	296	3.22	105.18	952
1919						
Jan. 10.....	".....	64	208	1.83	103.76	380(a)
Feb. 7.....	Hatton, M.....	64	142	1.65	102.85	234(a)
Mar. 12.....	Ronald, F.....	64	168	1.94	103.20	326(a)
" 24.....	".....	64	424	4.77	107.18	2,022
May 15.....	Hatton, M.....	64	302	3.71	105.30	1,122
" 15.....	".....	64	302	3.85	105.30	1,163
July 2.....	Ronald, F.....	64	134	1.69	102.60	226
Aug. 15.....	Hatton, M.....	61	37	1.05	101.14	39
Sept. 13.....	Ronald, F.....	57	40	1.05	101.18	42

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in Second-feet of Napanee River near Napanee for year ending
September 30th, 1919

Day	October			November			December			January			February			March			April			May			June			July			August			September																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet	Gauge Ht.	Dis- charge	Feet																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

Monthly Discharge of Napanee River near Napanee for year ending
September 30th, 1919

Drainage Area, 300 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	870	108	300	2.90	.36	1.00	1.15
November "	645	500	547	2.15	1.67	1.82	2.03
December "	800	398	578	2.67	1.33	1.93	2.22
January (1919)	705	268	451	2.35	.89	1.50	1.73
February	297	112	166	.99	.37	.55	.57
March	2,530	194	1,021	8.43	.65	3.40	3.92
April	1,800	670	1,133	6.00	2.23	3.78	4.22
May	1,950	705	1,283	6.50	2.35	4.28	4.93
June	1,430	157	574	4.77	.52	1.91	2.13
July	239	38	110	.77	.13	.37	.43
August	58	18	35	.19	.06	.12	.14
September	38	21	32	.13	.07	.11	.12
The year	2,530	18	521	8.43	.06	1.74	23.59

Petawawa River near Petawawa

Location—About $1\frac{1}{2}$ miles southwest of Petawawa station above C.P.R. bridge, near lot 15, concession 7, township of Petawawa, County of Renfrew.

Records Available—Discharge measurements from October, 1915, and daily gauge heights from November 5, 1915.

Drainage Area—1,572 square miles.

Gauge—Gauge is fastened to large rock in river, back of Rantz's house, 1,000 feet above section and 200 feet above the head of the rapids.

Channel and Control—The controlling section is a few hundred yards above the metering section. The river is straight for a few hundred feet each side of the section, but is crooked and fast for two miles below the section. The soundings for depths are taken for each metering as the water is fast and the river bed of stones may change slightly between meterings, and the depths do not change the same as the gauge readings.

Discharge Measurements—The discharge measurements for normal and low flows, summer and winter, are made by wading in fast water near the end of the straight stretch in the river downstream from the gauge. At high water measurements are made from the road bridge leading to Petawawa Military Camp.

Winter Flow—The control here is at fast water and only slightly affected by ice.

Accuracy—Gauge readings twice daily give good mean daily gauge height as the fluctuation at the gauge is slow.

Observer—Elsa Rantz, Petawawa.

Discharge Measurements of Petawawa River near Petawawa for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 4.....	Ronald, F.	164	453	4.00	102.75	1,819
1919						
April 22.....	"	164	879	6.24	104.67	5,485
May 3.....	"	164	782	6.21	104.67	4,869
June 1.....	"	164	910	5.55	104.50	5,059
" 25.....	"	164	633	4.88	103.33	3,089
July 24.....	Hatton, M.	164	535	4.33	102.75	2,315
Sept. 11.....	Ronald, F.	164	264	3.68	101.92	970

Daily Gauge Height in feet and Discharge in second-feet of Petawawa River near Petawawa for year ending
September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	101.83	765	102.42	1540	102.75	2000	102.58	1760	102.33	1410	102.08	1070	102.50	1650	104.67	5480	104.58	5260	103.17	2640	102.50	1650	101.67	575
2	101.83	765	102.42	1540	102.75	2000	102.58	1760	102.29	1360	102.08	1070	102.50	1650	104.67	5480	104.38	4820	103.12	2560	102.42	1540	101.67	575
3	101.83	765	102.42	1540	102.75	2000	102.54	1710	102.25	1300	102.08	1070	102.50	1650	104.67	5480	104.21	4470	103.04	2440	102.33	1410	101.58	480
4	101.83	765	102.42	1540	102.75	2000	102.50	1650	102.25	1300	102.08	1070	102.54	1710	104.67	5480	104.17	4390	103.00	2380	102.33	1410	101.58	480
5	102.00	970	102.42	1540	102.67	1890	102.50	1650	102.25	1300	102.08	1070	102.54	1710	104.67	5480	104.08	4210	103.00	2380	102.25	1300	101.58	480
6	102.04	1020	102.42	1540	102.67	1890	102.50	1650	102.25	1300	102.00	970	102.62	1820	104.58	5260	104.12	4290	102.96	2320	102.25	1300	101.58	480
7	102.16	1180	102.46	1590	102.67	1890	102.50	1650	102.25	1300	102.00	970	102.71	1940	104.58	5170	104.17	4390	102.92	2260	102.12	1130	101.71	620
8	102.25	1300	102.50	1650	102.67	1890	102.50	1650	102.25	1300	102.00	970	103.03	2380	104.38	4820	104.21	4470	102.92	2260	102.12	1130	101.71	620
9	102.25	1300	102.50	1650	102.67	1890	102.58	1760	102.25	1300	102.00	970	103.04	2440	104.29	4630	104.46	4990	102.92	2260	102.08	1070	101.96	920
10	102.25	1300	102.50	1650	102.62	1820	102.58	1760	102.25	1300	102.04	1020	103.25	2770	104.21	4470	104.67	5480	102.92	2260	102.08	1070	102.00	920
11	102.25	1300	102.50	1650	102.58	1760	102.58	1760	102.17	1190	102.08	1070	103.50	3170	104.17	4390	104.67	5480	102.92	2260	102.04	1020	101.96	920
12	102.29	1360	102.50	1650	102.62	1820	102.50	1650	102.17	1190	102.00	970	103.83	3740	104.17	4390	104.67	5480	102.92	2260	102.00	970	101.83	765
13	102.33	1410	102.54	1710	102.67	1890	102.46	1590	102.17	1190	102.00	970	104.04	4140	104.08	4210	104.54	5170	102.75	2000	102.00	970	101.83	765
14	102.29	1360	102.58	1760	102.67	1890	102.42	1540	102.17	1190	102.00	970	104.08	4210	104.08	4210	104.54	5170	102.75	2000	102.00	970	101.83	765
15	102.25	1300	102.58	1760	102.67	1890	102.46	1590	102.17	1190	102.00	970	104.04	4140	104.08	4210	104.54	5170	102.75	2000	102.00	970	101.83	765
16	102.25	1300	102.58	1760	102.67	1890	102.50	1650	102.17	1190	102.00	970	104.04	4140	104.04	4140	104.12	4290	102.82	2110	101.88	825	101.75	670
17	102.25	1300	102.58	1760	102.67	1890	102.50	1650	102.17	1190	102.00	970	104.04	4140	104.04	4140	104.12	4290	102.79	2060	101.83	765	101.75	670
18	102.25	1300	102.62	1820	102.67	1890	102.50	1650	102.17	1190	102.08	1070	104.29	4630	104.00	4060	103.86	3800	102.96	2320	101.83	765	101.75	670
19	102.25	1300	102.67	1890	102.62	1820	102.42	1540	102.17	1190	102.08	1070	104.46	4990	104.00	4060	103.79	3670	103.88	3830	101.83	765	101.67	575
20	102.25	1300	102.71	1940	102.58	1760	102.42	1540	102.17	1190	102.12	1130	104.50	5080	103.87	3820	103.54	3240	103.67	1890	101.83	765	101.67	575
21	102.21	1240	102.79	2060	102.62	1820	102.38	1480	102.12	1130	102.17	1190	104.54	5170	103.92	3910	103.42	3040	102.71	1940	101.83	765	101.67	575
22	102.12	1130	102.92	2260	102.67	1890	102.33	1410	102.08	1070	102.21	1240	104.67	5480	103.96	3980	103.42	3040	102.75	2000	101.83	765	101.67	575
23	102.00	970	102.92	2260	102.67	1890	102.38	1480	102.08	1070	102.25	1300	104.67	5480	103.93	4710	103.46	3110	102.75	2000	101.83	765	101.67	575
24	102.08	1070	102.92	2260	102.67	1890	102.38	1480	102.17	1190	102.29	1360	104.67	5480	104.62	5360	103.46	3110	102.75	2000	101.83	765	101.67	575
25	102.08	1070	102.87	2180	102.67	1890	102.33	1410	102.17	1190	102.29	1360	104.67	5480	104.83	5880	103.38	2980	102.75	2000	101.83	765	101.67	575
26	102.12	1130	102.83	2120	102.67	1890	102.33	1410	102.08	1070	102.33	1420	104.67	5480	104.83	5880	103.33	2900	102.75	2000	101.83	765	101.67	575
27	102.17	1190	102.75	2000	102.67	1890	101.35	1440	102.08	1070	102.42	1540	104.67	5480	104.83	5880	103.33	2900	102.71	1940	101.75	670	101.67	575
28	102.29	1360	102.75	2000	102.62	1820	102.33	1410	102.08	1070	102.46	1590	104.67	5480	104.83	5880	103.25	2770	102.62	1820	101.75	670	101.67	575
29	102.38	1480	102.75	2000	102.58	1760	102.33	1410	.....	.....	102.54	1710	104.67	5480	104.79	5780	103.12	2560	102.54	1710	101.75	670	101.67	575
30	102.42	1540	102.75	2000	102.58	1760	102.33	1410	.....	.....	102.58	1760	104.67	5480	104.71	5580	103.00	2380	102.50	1650	101.75	670	101.67	575
31	102.42	1540	.....	.....	102.58	1760	102.33	1410	.....	.....	102.58	1760	.....	.....	104.67	5480	.....	.....	102.50	1650	101.75	670	.....	.....

**Monthly Discharge of Petawawa River near Petawawa for year ending
September 30th, 1919**

Drainage Area, 1,572 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918) ..	1,540	765	1,196	.98	.49	.76	.88
November " ..	2,260	1,540	1,821	1.44	.98	1.16	1.29
December " ..	2,000	1,760	1,881	1.27	1.12	1.20	1.38
January (1919) ..	1,760	1,410	1,578	1.12	.90	1.00	1.15
February	1,410	1,070	1,212	.90	.68	.77	.80
March	1,760	970	1,180	1.12	.62	.75	.86
April	5,480	1,650	3,906	3.49	1.05	2.48	2.77
May	5,880	3,820	4,890	3.74	2.43	3.11	3.58
June	5,480	2,360	4,025	3.49	1.50	2.56	2.86
July	3,830	1,650	2,203	2.44	1.05	1.40	1.61
August	1,650	670	955	1.05	.43	.61	.70
September	970	480	628	.62	.31	.40	.45
The year	5,880	480	2,125	3.74	.31	1.35	18.35

Tay River near Glen Tay

Location—Near lots 20 and 21, concession II, Township of Bathurst, County of Lanark, at the highway bridge south of the Village of Glen Tay, and east of the auxiliary plant of the Canadian Electric & Water Company, Limited, of Perth and Ottawa.

Records Available—Discharge measurements July, 1915, and gauge readings from July 10, 1915.

Drainage Area—204 square miles.

Gauge—Vertical steel staff 0 to 3 feet fastened to the pier of bridge one foot above section.

Channel and Control—The channel is straight from the dam 150 feet above and straight for 250 feet below the section. The banks are high, and not liable to overflow. The bed of the river is composed of shale and stones, not shifting. The flow is confined between the bridge abutments at all stages. The control is a short distance below the section, and the flood flow is likely to disturb it to some extent.

Discharge Measurements—Made by wading at ordinary stages, and from the bridge at very high stages.

Winter Flow—Channel at section remains free from ice during winter, but relation of gauge height to discharge is affected by ice formation below the section.

Regulation—The river is dammed immediately above the section and one mile further up, for power purposes, and the Department of Railways and Canals operate a dam at the foot of Bob's Lake for regulating for canal purposes.

Accuracy—On April 18th, 1919, the dam above the section collapsed and carried away part of the bridge. The debris was deposited about 100 feet down-stream and has backed the water up to the extent of about one foot at the gauge. Allowance has been made for this back-water in estimating the daily flow.

Observer—Paul Griffin, Manion P.O.

Discharge Measurements of Tay River near Glen Tay for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
December 3.....	Ronald, F.....	40	56	3.71	94.42	208
1919						
January 17.....	"	40	59	4.54	94.48	268 (a)
February 13.....	"	39	46	3.48	94.30	160 (a)
March 26.....	"	47	110	4.49	95.55	499
May 8.....	"	50	130	3.60	95.61	483 (b)
" 30.....	"	50	179	3.85	96.48	690 (b)
June 20.....	"	50	149	2.70	95.88	403 (b)
August 7.....	Hatton, M	50	132	1.53	95.55	202 (b)
September 9.....	Ronald, F.....	50	142	1.80	95.65	256 (b)

(a) Ice measurement.

(b) Backwater from debris below section.

Daily Gauge Height in feet and Discharge in second-feet of Tay River near Glen Tay for year ending
September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	94.40	203	94.61	276	94.48	231	94.27	158	94.51	242	94.28	161	94.55	256	95.57	469	96.30	580	95.80	332	95.59	25.9	95.65	252
2	94.52	245	94.55	256	94.48	231	94.51	242	94.44	217	94.36	189	94.55	256	95.75	530	96.30	590	95.80	332	95.57	25.2	95.65	252
3	94.34	182	94.46	224	94.42	210	94.51	242	94.57	262	94.36	189	94.55	256	95.71	520	96.30	590	95.80	332	95.59	25.9	95.65	252
4	94.31	172	94.53	248	94.44	217	94.57	262	94.36	189	94.34	182	94.55	256	95.84	565	96.30	590	95.80	332	95.53	23.8	95.65	252
5	94.48	231	94.53	248	94.42	210	94.55	256	94.53	248	94.48	231	94.55	256	95.96	605	96.30	590	95.78	325	95.57	25.2	95.63	245
6	94.40	203	94.50	238	94.48	231	94.55	256	94.51	242	94.30	168	94.63	284	95.92	590	96.30	590	95.75	315	95.53	23.8	95.63	245
7	94.51	242	94.50	238	94.48	231	94.55	256	94.53	248	94.40	203	94.80	343	95.71	520	96.30	590	95.73	308	95.59	25.9	95.63	245
8	94.46	224	94.48	231	94.38	196	94.55	256	94.53	248	94.38	196	94.80	343	95.71	520	96.30	590	95.71	301	95.63	24.5	95.63	245
9	94.46	224	94.50	238	94.44	217	94.55	256	94.42	210	94.44	217	94.95	396	95.63	441	96.30	590	95.69	294	95.59	23.1	95.65	252
10	94.44	217	94.57	262	94.63	284	94.71	312	94.46	224	94.30	168	94.86	364	95.63	441	96.21	555	95.71	301	95.65	25.2	95.63	255
11	94.40	203	94.55	256	94.46	224	94.55	256	94.42	210	94.40	203	95.05	430	95.84	515	96.13	550	95.71	301	95.71	27.3	95.63	255
12	94.55	256	94.55	256	94.30	168	94.51	242	94.28	161	94.46	224	95.21	486	95.96	555	96.13	550	95.67	287	95.71	27.3	95.58	238
13	94.36	189	94.55	256	94.40	203	94.55	256	94.42	210	94.40	203	95.00	413	95.96	555	96.13	550	95.67	287	95.71	27.3	95.42	182
14	94.42	210	94.32	175	94.44	217	94.55	256	94.44	217	94.38	196	94.80	343	95.88	530	96.05	500	95.69	294	95.71	27.3	95.48	203
15	94.42	210	94.32	175	95.09	444	94.53	248	94.28	161	94.38	196	94.61	304	95.71	469	96.05	500	95.71	301	95.71	27.3	95.46	196
16	94.40	203	94.32	175	95.05	430	94.53	248	94.42	210	94.42	203	95.41	555	95.75	483	95.96	469	95.71	301	95.71	27.3	95.44	189
17	94.33	178	94.19	130	94.86	364	94.53	248	94.42	210	95.38	545	96.93	945	95.80	500	95.96	469	95.71	301	95.75	28.7	95.44	189
18	94.25	150	94.55	256	94.69	304	94.53	248	94.42	210	95.38	545	96.93	945	95.80	500	95.96	469	95.71	301	95.71	27.3	95.42	182
19	94.31	172	94.59	270	94.55	256	94.53	248	94.36	189	95.13	740	96.30	725	95.71	469	95.90	448	95.71	301	95.71	27.3	95.42	182
20	94.25	150	94.59	270	94.43	214	94.71	312	94.38	196	96.42	910	96.09	650	96.05	590	95.88	360	95.67	287	95.71	27.3	95.42	182
21	94.40	203	94.59	270	94.43	214	94.71	312	94.38	196	96.42	910	96.09	650	96.05	590	95.88	360	95.67	287	95.71	27.3	95.42	182
22	94.34	182	94.61	276	94.84	357	94.83	354	94.42	210	96.71	1010	95.69	510	96.67	805	95.84	346	95.71	301	95.71	27.3	95.42	182
23	94.31	172	94.59	270	94.71	312	94.83	354	94.42	210	96.71	1010	95.69	510	96.67	805	95.84	346	95.71	301	95.71	27.3	95.42	182
24	94.34	182	94.61	276	94.84	357	94.83	354	94.42	210	96.71	1010	95.69	510	96.67	805	95.84	346	95.71	301	95.71	27.3	95.42	182
25	94.31	172	94.59	270	94.71	312	94.83	354	94.42	210	96.71	1010	95.69	510	96.67	805	95.84	346	95.71	301	95.71	27.3	95.42	182
26	94.38	196	94.42	210	94.44	217	94.33	178	94.51	242	95.59	620	95.55	462	97.13	965	95.80	332	95.65	280	95.65	25.2	95.36	161
27	94.23	144	94.42	210	94.71	312	94.48	231	94.31	172	95.55	605	95.55	462	96.80	850	95.82	340	95.63	273	95.65	25.2	95.40	175
28	94.36	189	94.42	210	94.61	276	94.50	238	94.15	116	94.84	357	95.55	462	96.55	765	95.88	360	95.63	273	95.67	25.9	95.38	168
29	94.53	248	94.46	224	94.67	298	94.50	238	.....	.....	94.96	399	95.55	462	96.55	765	95.84	346	95.61	266	95.67	25.9	95.34	154
30	94.53	248	94.48	221	94.63	284	94.51	242	.....	.....	94.63	284	95.55	462	96.38	705	95.82	340	95.61	266	95.67	25.9	95.34	154
31	94.59	270	.....	.....	94.51	242	94.61	276	.....	.....	94.63	284	95.55	462	96.30	590	.....	.....	95.59	259	95.67	25.9	.....	.....

**Monthly Discharge of Tay River near Glen Tay for year ending
September 30th, 1919**

Drainage Area, 204 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	270	144	204	1.32	.71	1.00	1.15
November "	276	130	234	1.35	.64	1.15	1.28
December "	444	168	262	2.18	.82	1.28	1.48
January (1919)	354	158	252	1.74	.77	1.24	1.43
February	262	116	208	1.28	.57	1.02	1.06
March	1,010	161	383	4.95	.79	1.88	2.17
April	945	256	430	4.63	1.25	2.11	2.35
May	1,230	441	631	6.03	2.16	3.09	3.56
June	590	332	475	2.89	1.63	2.33	2.60
July	332	259	296	1.63	1.27	1.45	1.67
August	287	231	261	1.41	1.13	1.28	1.48
September	255	154	206	1.25	.75	1.01	1.13
The year	1,230	116	321	6.03	.57	1.57	21.36

York River near Bancroft

Location—At the highway bridge one and a half miles below Bancroft, near lots 53 and 54, west of the Hastings Road, Township of Faraday, County of Hastings.

Records Available—Discharge measurements from July, 1915. Daily gauge heights from July 16, 1915.

Drainage Area—374 square miles.

Gauge—Vertical standard gauge plates 0 to 6 ft. secured on the upstream face of the right bridge pier near the west corner.

Channel and Control—The channel is straight for 400 feet above and 250 feet below the section. The banks are high and sandy, not liable to overflow. The bed is composed of gravel. Flow takes place in three channels under the bridge at high stages, and in two channels at lower stages.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice materially affects the open-water relation of gauge heights to discharge, and frazil ice at times makes meterings difficult.

Regulation—The dam at Bancroft gives very small storage, and the plants there do not use the entire flow. On account of the electrical plant working at night, and the other mills during the day, daily gauge readings give fairly accurate figures for the mean daily stage. Some of the tributary streams are controlled by dams for storage and driving purposes for the lumber industry.

Accuracy—As the river bed is composed of gravel, slight movement no doubt takes place without changing the general profile and section.

Observer—H. McNevin, Bancroft.

Discharge Measurements of York River near Bancroft for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Dec. 13.....	Ronald, F.....	68	393	2.20	103.94	864
1919						
Jan. 8.....	".....	62	344	1.92	103.25	660
Feb. 5.....	Hatton, M.....	68	274	1.39	102.17	380 (a)
Mar. 13.....	Ronald, F.....	65	223	1.04	101.31	233 (a)
April 18.....	Hatton, M.....	68	322	1.84	102.87	592
Aug. 13.....	".....	58	185	.79	100.77	147
Sept. 15.....	Ronald, F.....	62	198	.77	100.83	153

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of York River near Bancroft for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	101.08	186	102.89	560	103.75	780	103.54	720	102.80	515	101.58	344	102.54	480	103.17	630	106.00	1440	103.21	635	101.38	244	101.00	171
2	101.25	218	103.08	605	104.95	1140	103.50	710	102.92	545	101.42	213	102.58	489	103.46	740	105.66	1340	103.38	680	101.15	200	101.00	171
3	101.42	252	103.23	640	105.17	1200	103.42	690	102.67	487	101.38	205	102.42	455	104.95	1140	105.25	1290	103.29	655	101.08	186	101.08	186
4	101.50	268	103.25	645	105.00	1150	103.25	650	102.40	430	101.42	213	102.42	455	104.75	1070	104.67	1050	102.54	480	101.08	186	101.00	171
5	101.62	292	103.23	640	104.83	1100	104.25	930	102.25	398	101.38	205	102.46	464	104.79	1090	104.83	1100	101.67	302	101.00	171	101.00	171
6	101.83	334	103.08	605	104.75	1070	104.67	1050	102.17	398	101.38	205	102.46	464	104.79	1090	105.29	1240	101.54	276	101.04	179	101.00	171
7	102.42	455	103.04	605	104.67	1050	.....	910	102.12	372	101.71	270	102.71	520	105.16	1200	105.62	1330	101.58	284	101.08	186	101.00	171
8	102.58	489	103.00	590	104.46	990	.....	775	102.08	364	101.69	266	102.87	560	105.46	1330	102.96	580	101.42	252	101.00	171	101.04	179
9	102.58	489	103.02	595	104.33	950	103.21	635	102.12	372	101.58	244	102.87	560	105.46	1280	104.29	940	101.42	252	101.00	171	101.00	171
10	102.58	489	103.08	605	104.25	930	103.25	650	102.83	520	101.50	228	103.04	600	105.42	1270	104.38	965	101.42	252	101.00	171	101.00	171
11	102.58	489	103.01	590	104.17	905	103.62	745	102.83	520	101.54	256	102.71	520	104.42	975	104.38	965	101.42	252	101.12	194	101.04	179
12	102.62	497	103.00	590	104.08	880	104.42	975	.....	467	101.33	215	102.67	510	104.70	1060	104.38	965	101.42	252	101.04	179	100.96	164
13	102.67	510	102.96	580	104.00	855	104.67	1050	.....	416	101.67	282	102.67	510	104.83	1100	104.29	940	101.42	252	100.79	133	100.83	140
14	102.67	510	102.92	570	104.08	880	104.58	995	.....	365	101.62	272	102.58	489	105.42	1270	104.25	930	101.42	252	101.04	179	100.83	140
15	102.67	510	103.29	655	104.10	885	104.10	885	101.83	314	101.54	256	102.37	445	105.42	1270	104.21	920	101.42	252	101.08	186	100.83	140
16	102.67	510	103.33	670	104.12	890	102.67	487	101.92	332	101.37	222	102.29	428	105.02	1160	102.71	515	101.42	252	101.04	179	100.83	140
17	102.67	510	103.25	645	103.98	850	102.50	451	102.33	415	101.33	215	102.37	445	105.00	1150	102.50	472	101.46	260	101.00	171	100.96	164
18	102.69	515	.....	660	103.92	830	102.58	468	101.83	314	101.80	308	102.54	440	104.96	1140	102.42	455	101.88	344	101.00	171	100.83	140
19	102.71	515	.....	675	103.83	805	102.50	451	101.75	298	101.83	314	103.46	700	104.83	1100	102.21	411	101.26	220	101.08	186	100.79	133
20	102.71	515	.....	690	103.73	780	102.50	451	101.83	314	102.00	348	104.08	880	102.38	447	102.04	376	101.00	171	101.00	171	100.83	140
21	103.04	600	.....	700	103.67	760	102.46	443	101.76	300	102.08	364	104.17	905	103.71	770	102.00	368	101.08	186	101.04	179	100.71	120
22	103.25	645	.....	710	103.71	770	102.42	434	101.69	286	102.04	356	104.25	930	104.96	1140	101.92	352	101.58	284	101.08	186	100.83	140
23	103.21	635	103.54	720	103.88	820	102.46	443	101.67	282	102.21	390	104.33	955	106.00	1440	101.83	334	103.16	625	101.08	186	100.83	140
24	103.21	635	103.50	720	103.92	830	102.50	451	101.58	266	102.04	356	104.37	960	106.00	1440	101.67	302	103.25	650	101.08	186	100.83	140
25	103.25	645	.....	720	103.85	810	102.71	495	101.58	266	102.79	513	104.50	1000	.....	1480	101.67	302	103.58	735	101.80	328	100.79	133
26	103.25	645	.....	730	103.75	780	102.44	438	101.58	266	103.12	615	105.21	1210	.....	1510	101.67	302	103.83	805	101.08	186	100.79	133
27	103.17	625	.....	740	103.67	760	102.40	432	101.75	278	103.33	670	105.42	1270	.....	1550	101.67	302	102.17	403	100.96	164	100.83	140
28	103.21	635	103.62	745	103.75	780	102.33	415	101.92	312	103.42	690	105.42	1270	.....	1590	102.30	430	102.42	455	100.83	140	100.83	140
29	103.23	640	103.77	785	.....	765	102.33	407	.....	.....	103.92	830	105.42	1270	.....	1540	102.42	455	103.04	600	100.88	149	100.92	157
30	103.25	645	103.75	780	.....	750	102.25	398	.....	.....	103.42	690	104.21	920	.....	1500	102.21	411	103.29	655	101.21	211	100.96	164
31	103.25	645	.....	.....	.....	735	102.25	398	.....	.....	102.50	472	.....	.....	.....	1470	.....	.....	101.92	352	101.04	179	.....	.....

NOTE—May 25th to 31st—Water above gauge—Estimated High Water—106.50

Monthly Discharge of York River near Bancroft of year ending September 30th, 1919

Drainage Area, 374 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per square mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October... (1918)	645	186	502	1.72	.50	1.34	1.54
November ..	785	560	658	2.10	1.50	1.76	1.96
December ..	1,200	735	886	3.21	1.96	2.37	2.73
January ..(1919)	1,050	398	617	2.81	1.06	1.65	1.90
February	545	266	371	1.46	.71	.99	1.03
March.....	830	205	362	2.22	.55	.97	1.12
April	1,270	428	705	3.40	1.14	1.89	2.11
May.....	1,590	447	1,191	4.25	1.20	3.18	3.67
June	1,440	302	724	3.85	.81	1.94	2.16
July.....	805	171	398	2.15	.46	1.06	1.22
August	328	133	185	.88	.36	.49	.56
September.....	186	86	152	.50	.23	.41	.46
The year	1,590	86	564	4.25	.23	1.51	20.50

Regular Stations

NORTHERN ONTARIO DISTRICT

River	Location	Drain- age Area Sq. Miles	Township	District
aux Sables	at Massey	524	Salter	Sudbury
Blanche	near Englehart	430	Evanturel	Temiskaming
Frederickhouse	at Frederickhouse	1,260	Fournier and Clute	"
Kapuskasing	at Kapuskasing	2,820	O'Brien	"
Mattagami	at Smooth Rock Falls	3,970	Kendry	"
Mississagi	at Iron Bridge	3,565	Gladstone	Algoma
"	at O'Neil's Farm	3,640	Thompson	"
South	at Cox's Chute	166	Himsworth	Parry Sound
"	near Powassan	294	"	"
Spanish	near Webbwood	4,340	Hallam	Sudbury
Sturgeon	near Smoky Falls	2,570	Field	Nipissing
Vermilion	near Whitefish	1,580	Graham	Sudbury
Wanapitei	at McVities	1,190	Secord	"

aux Sables River at Massey

Location—About 500 feet upstream from C. P. Ry. bridge, and $\frac{1}{4}$ mile northeast of railway station, in the Village of Massey, Township of Salter, Sudbury District.

Records Available—Discharge measurements from August, 1914. Daily gauge heights from June 10, 1915.

Drainage Area—524 square miles.

Gauge—A chain gauge has been established here reading zero with water at an elevation of 15.94 referred to a B.M. elevation 29.76 painted on top of rock on left bank at entrance to rapids. The gauge is located ten feet above the section.

Channel and Control—Straight for 1,000 feet above and 100 feet below the gauging station to a rapid. Both banks are high, rocky, wooded, and are not liable to overflow. The bed of the stream is composed of clay and gravel, practically permanent. The velocity is moderate, and one channel exists at all stages.

Discharge Measurements—Made by wading during low water periods. At high stages measurements are made from boat with a Price current meter.

Regulation—The operation of logging dams above cause fluctuations in gauge heights during the log-driving season.

Observer—Jas. Blight, Massey.

**Discharge Measurements of aux Sables River at Massey for year
ending September 30th, 1919**

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 29.....	Loy, R	98	676	1.62	23.17	1099
Dec. 22.....	Taylor, J. R....	94	478	1.57	21.08	751
1919						
Jan. 18.....	"	91	246	1.87	19.27	459(a)
" 19.....	"	91	244	2.08	19.27	509(a)
Feb. 26.....	"	83	157	2.11	17.92	332(a)
May 5.....	"	96	786	1.67	24.44	1310
July 29.....	Loy, R.....	68	93	2.05	16.69	190
Sept. 29.....	Taylor, J. R.	96	725	1.61	23.74	1169

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of aux Sables River at Massey for year ending
September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	17.11	234	22.19	1000	23.36	1120	19.94	575	18.77	394	18.11	357	23.27	1170	24.16	1320	24.27	1330	21.02	815	16.67	192	17.44	269
2	17.11	234	21.27	855	23.52	1150	19.94	575	18.69	383	18.11	357	23.36	1190	24.06	1300	24.44	1360	20.69	760	16.67	192	17.36	261
3	17.19	242	21.44	880	23.77	1190	19.94	575	18.52	359	18.02	345	23.44	1200	23.70	1240	24.27	1313	20.46	725	16.77	200	17.36	261
4	17.19	242	21.44	880	22.02	910	19.94	575	18.44	348	18.11	357	23.44	1200	24.13	1310	24.97	1440	20.37	710	16.69	193	17.36	261
5	17.21	251	21.44	880	22.36	965	19.94	575	18.44	348	18.11	357	23.44	1200	24.03	1290	24.11	1310	21.02	815	16.69	193	17.27	251
6	18.77	454	21.27	855	22.61	1000	19.92	575	18.44	348	18.11	357	23.69	1240	24.44	1360	24.29	1340	19.44	560	16.69	193	17.27	251
7	17.94	334	22.94	1120	22.61	1000	19.92	575	18.44	348	18.11	357	24.69	1400	24.94	1440	24.44	1360	19.11	510	16.69	193	17.27	251
8	17.94	334	23.27	1170	22.36	965	19.79	550	18.44	348	17.94	334	26.61	1720	25.36	1510	24.36	1350	18.44	405	16.69	193	17.19	242
9	17.77	310	23.27	1170	22.36	965	19.67	535	18.36	336	17.94	334	.....	.....	23.44	1440	24.19	1320	18.19	369	16.69	193	17.19	242
10	17.94	334	23.27	1170	22.36	965	19.75	545	18.36	336	17.77	310	.....	.....	23.11	1150	23.86	1270	17.94	334	16.69	193	17.19	242
11	18.02	345	23.27	1170	22.27	950	19.75	545	18.36	336	17.77	310	.....	.....	22.94	1120	24.11	1310	17.86	322	16.69	193	17.19	242
12	18.19	369	23.94	1280	22.19	935	19.46	500	18.19	313	17.69	300	.....	.....	22.44	1040	24.29	1340	17.86	322	16.69	193	17.19	242
13	18.44	405	22.94	1120	22.19	935	19.44	496	18.11	301	17.61	289	30.44	2330	22.44	1040	24.29	1340	17.86	322	16.69	193	17.19	242
14	18.61	430	22.61	1070	22.11	925	19.44	496	18.11	301	17.77	310	29.61	2200	22.27	1010	24.11	1310	17.69	299	16.77	200	17.69	299
15	18.69	442	22.36	1030	22.02	910	19.34	464	18.11	301	17.94	334	29.02	2100	22.36	1030	23.86	1270	17.61	289	16.79	202	18.29	383
16	18.52	417	21.94	960	21.85	865	19.04	435	18.02	290	18.86	470	28.27	1980	24.19	1320	23.61	1230	17.44	269	16.77	200	18.52	417
17	18.52	417	22.77	1090	21.75	865	19.04	435	18.02	290	19.19	520	28.27	1980	27.94	1930	23.69	1240	17.27	251	17.02	225	19.69	600
18	18.44	405	24.27	1330	21.57	835	19.27	470	17.86	272	19.86	630	28.44	2010	27.61	1880	23.86	1270	17.11	234	17.19	242	20.27	695
19	18.44	405	24.27	1330	21.23	785	19.27	470	17.86	272	20.36	710	28.02	1940	27.44	1850	24.11	1310	17.11	234	17.36	261	20.94	800
20	18.44	405	24.36	1350	20.97	740	19.19	458	17.86	272	21.19	840	27.77	1900	27.44	1850	23.86	1270	17.02	225	17.36	261	21.11	830
21	18.44	405	24.44	1360	20.79	715	19.19	446	17.77	273	21.52	895	27.77	1900	27.44	1850	23.86	1270	17.02	225	17.36	261	21.11	830
22	18.36	893	24.44	1360	20.37	645	19.19	446	17.77	273	21.52	895	27.77	1900	27.44	1850	23.86	1270	17.02	225	17.36	261	21.11	830
23	18.11	357	24.44	1360	20.44	655	19.02	432	17.77	284	21.94	960	27.27	1820	27.36	1840	23.36	1190	16.86	209	17.69	299	21.65	915
24	18.36	893	24.44	1360	20.36	645	19.02	432	17.77	296	22.27	1010	26.86	1760	27.02	1780	23.02	1130	16.69	193	17.77	310	21.79	935
25	23.44	1200	24.27	1310	20.36	645	19.02	432	17.77	296	22.27	1010	26.86	1760	27.02	1780	23.02	1130	16.69	193	17.77	310	21.79	935
26	24.27	1330	24.27	1310	20.36	645	18.94	420	17.86	332	22.69	1080	26.52	1700	26.61	1640	22.52	1050	16.69	193	17.61	289	22.25	1010
27	25.19	1480	23.69	1210	20.27	630	18.94	420	18.02	345	23.11	1150	26.27	1600	25.61	1550	22.11	990	16.69	193	17.51	277	22.65	1070
28	25.44	1520	23.36	1140	20.19	615	18.86	408	18.02	345	23.11	1150	26.27	1600	25.61	1550	22.11	990	16.69	193	17.44	269	23.73	1250
29	24.94	1440	23.19	1100	20.19	615	18.86	408	.....	.....	23.44	1200	25.60	1550	25.27	1490	21.44	885	16.69	193	17.44	269	23.86	1270
30	24.27	1330	23.27	1110	20.11	605	18.77	394	.....	.....	23.44	1200	25.17	1480	24.44	1360	21.19	840	16.69	193	17.44	269	.....	.....
31	23.11	1150	.....	.....	20.11	605	18.77	394	.....	.....	23.44	1200	.....	.....	24.11	1310	.....	.....	16.67	192	17.44	269	.....	.....

Monthly Discharge of aux Sables River at Massey for year ending September 30th, 1919

Drainage Area. 524 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	1,520	234	585	2.90	.45	1.12	1.29
November "	1,360	855	1,144	2.60	1.63	2.18	2.43
December "	1,190	605	840	2.27	1.15	1.60	1.84
January .. (1919)	575	394	489	1.10	.75	.93	1.07
February.	394	272	321	.75	.52	.61	.64
March.	1,200	289	623	2.29	.55	1.19	1.37
April.	2,330	1,170	1,674	4.45	2.23	3.19	3.56
May.	1,930	1,010	1,468	3.68	1.93	2.80	3.23
June.	1,440	840	1,238	2.75	1.60	2.36	2.63
July.	815	187	362	1.56	.36	.69	.80
August.	313	192	228	.60	.37	.44	.51
September.	1,270	242	546	2.42	.46	1.04	1.16
The year.	2,330	187	793	4.45	.36	1.51	20.54

Blanche River near Englehart

Location—At the highway bridge near the High Falls, $3\frac{1}{2}$ miles south-west of the Town of Englehart, north half of lot 12, concession 3, Township of Evanturel, Timiskaming District.

Records Available—Discharge measurements from August, 1914. Gauge heights from October 8, 1914, with occasional omissions.

Drainage Area—430 square miles.

Gauge—Vertical steel staff 0-12 feet, located on the southeast downstream side of first pier. The zero of the gauge (elev. 8.00) is referred to B.M. elev. 23.39, painted on a conspicuous rock on the right bank 75 feet below the bridge.

Channel—At a point 200 feet above the station, the river curves from the right and then flows straight, up to a point 700 feet below the station. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of clay, practically permanent. The current is very slow, flowing through 2 channels at low stages and 3 channels during high water periods.

Discharge Measurements—Made from the highway bridge with a Price current meter.

Winter Flow—During the winter months measurements are made through the ice to determine the winter discharge. The relation of gauge height to discharge is seriously affected by ice.

Regulation—A temporary dam is built above the station during the summer months. This dam is used for storing water during the period when the river is used for log driving. The gauge heights at the section are, therefore, affected during the log driving periods.

Accuracy—Rating curve fairly well defined between gauge heights 10.50 feet and 12.00 feet.

Observer—W. D. Groom, Englehart.

Discharge Measurements of Blanche River near Englehart for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 27.....	Taylor, J. R....	114	781	.86	12.70	675 (a)
1919						
February 19.....	"	45	209	.51	10.02	107 (b)
April 14.....	"	116	1,125	1.85	15.44	2,079 (a)
June 3.....	"	114	835	.66	13.02	555 (a)

(a) Logs below section.

(b) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Blanche River near Englehart for year
ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	13.25	820	12.00	352	12.00	352	12.00	312	10.50	134	9.83	98	10.25	131	17.00	3350	13.46	905	10.42	186	9.33	113	11.46	324
2	13.08	760	14.00	1160	14.00	1160	12.00	312	10.50	134	9.83	98	10.25	131	17.33	3600	13.08	760	10.37	182	9.29	112	11.67	366
3	12.79	655	13.96	1140	12.00	352	12.17	346	10.50	134	9.83	98	10.25	131	17.33	3600	12.92	700	10.67	209	9.21	108	11.62	356
4	12.79	655	13.83	1070	12.00	352	11.83	284	10.50	134	9.83	98	10.25	131	17.33	3600	12.92	700	10.67	209	9.21	108	11.62	356
5	12.79	655	13.54	945	11.67	290	11.83	284	10.42	129	10.17	115	10.42	141	17.54	3760	12.83	670	10.92	239	9.21	108	11.67	366
6	12.96	715	13.54	945	11.67	290	11.75	272	10.42	129	10.17	115	10.42	141	17.08	3410	13.33	850	10.66	208	9.21	108	11.46	324
7	13.67	1000	12.25	500	11.71	297	11.75	272	10.42	129	10.17	115	10.42	141	17.25	3540	13.08	760	10.66	208	9.21	108	11.46	324
8	14.00	1160	12.67	620	11.67	290	11.75	272	10.42	129	10.17	115	10.42	141	17.00	3350	13.21	805	10.63	205	9.50	122	13.42	890
9	13.75	1040	12.58	595	11.67	290	11.42	226	10.25	120	10.17	115	11.58	348	16.83	3220	13.17	790	10.62	204	9.50	122	15.25	2000
10	13.75	960	12.50	570	11.67	290	11.62	253	10.00	107	10.00	107	14.25	1300	16.42	2610	12.75	645	10.56	198	9.46	120	15.04	1840
11	13.92	1120	12.50	570	11.67	290	11.58	247	10.25	120	10.08	111	13.83	1070	15.92	2320	12.75	645	10.56	198	9.46	120	14.58	1510
12	13.92	1120	12.50	570	11.67	290	11.58	247	10.25	120	10.08	111	13.83	1070	15.92	2320	12.75	645	10.56	198	9.46	120	14.58	1510
13	13.50	925	12.42	550	11.54	271	11.50	236	10.33	124	9.75	94	16.00	2580	15.17	1950	11.00	250	10.16	165	9.46	120	14.00	1160
14	13.21	805	12.42	550	11.54	271	11.50	236	10.33	124	9.75	94	16.00	2580	15.17	1950	11.00	250	10.16	165	9.46	120	14.00	1160
15	13.21	805	12.33	520	11.42	253	11.25	207	10.33	124	9.75	94	16.00	2580	15.17	1950	11.00	250	10.16	165	9.46	120	14.00	1160
16	13.21	805	12.33	520	11.42	253	11.25	207	10.33	124	9.75	94	16.00	2580	15.17	1950	11.00	250	10.16	165	9.46	120	14.00	1160
17	13.37	870	12.46	560	11.50	265	11.29	211	10.25	120	9.67	90	16.58	3020	14.75	1620	11.00	250	10.16	165	9.46	120	14.00	1160
18	13.37	870	13.67	1000	11.75	303	11.17	199	10.25	120	9.67	90	16.58	3020	14.75	1620	11.00	250	10.16	165	9.46	120	14.00	1160
19	13.00	730	13.83	1070	11.75	303	11.17	199	10.25	120	9.67	90	16.58	3020	14.75	1620	11.00	250	10.16	165	9.46	120	14.00	1160
20	13.37	870	13.83	1070	11.75	303	11.17	199	10.25	120	9.67	90	16.58	3020	14.75	1620	11.00	250	10.16	165	9.46	120	14.00	1160
21	13.54	945	13.92	1120	12.17	386	11.25	207	10.17	115	9.67	90	16.25	2770	17.17	3480	10.92	239	10.04	157	9.50	122	11.83	399
22	13.08	760	13.92	1120	12.17	386	11.25	207	10.17	115	9.67	90	16.25	2770	17.17	3480	10.92	239	10.04	157	9.50	122	11.83	399
23	14.17	1260	13.58	960	12.00	352	11.25	207	10.17	115	9.67	90	16.25	2770	17.17	3480	10.92	239	10.04	157	9.50	122	11.83	399
24	14.00	1160	13.25	820	12.00	352	11.25	207	10.17	115	9.67	90	16.25	2770	17.17	3480	10.92	239	10.04	157	9.50	122	11.83	399
25	15.75	2390	13.21	805	12.00	352	10.42	141	9.92	103	10.00	107	17.58	3790	16.83	3100	11.04	256	10.08	160	9.75	137	13.00	730
26	15.87	2480	12.83	610	12.00	352	10.42	141	9.92	103	10.00	107	17.58	3790	16.83	3100	11.04	256	10.08	160	9.75	137	13.00	730
27	15.67	2330	12.33	470	11.83	318	10.25	120	10.00	107	10.00	107	17.58	3790	16.83	3100	11.04	256	10.08	160	9.75	137	13.00	730
28	15.46	2170	12.33	470	11.83	318	10.25	120	10.00	107	10.00	107	17.58	3790	16.83	3100	11.04	256	10.08	160	9.75	137	13.00	730
29	15.46	2170	12.33	470	11.83	318	10.25	120	10.00	107	10.00	107	17.58	3790	16.83	3100	11.04	256	10.08	160	9.75	137	13.00	730
30	14.96	1780	12.33	470	11.83	318	10.25	120	10.00	107	10.00	107	17.58	3790	16.83	3100	11.04	256	10.08	160	9.75	137	13.00	730
31	14.42	1410	11.92	336	11.92	336	10.75	164	10.00	107	10.00	107	17.58	3790	16.83	3100	11.04	256	10.08	160	9.75	137	13.00	730

NOTE.—Logs on control affect accuracy of estimates.

Monthly Discharge of Blanche River near Englehart for year ending
September 30th, 1919

Drainage Area, 430 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October...(1918)	2,480	655	1,157	5.77	1.52	2.69	3.10
November "	1,160	470	758	2.70	1.09	1.76	1.96
December "	386	220	306	.90	.51	.71	.82
January .. (1919)	346	131	226	.80	.30	.53	.61
February	134	94	116	.31	.22	.27	.28
March.....	134	90	105	.31	.21	.24	.28
April	3,870	131	2,239	9.00	.30	5.21	5.81
May.....	3,760	1,160	2,836	8.74	2.70	6.60	7.61
June.....	905	209	451	2.10	.49	1.05	1.17
July.....	239	106	178	.56	.25	.41	.47
August.....	300	108	141	.70	.25	.33	.38
September	2,000	324	885	4.65	.75	2.06	2.30
The year	3,870	90	785	9.00	.21	1.83	24.79

Frederickhouse River at Frederickhouse

Location—On the upstream side of the highway bridge crossing the river on the township line between the Townships of Fournier and Clute, District of Temiskaming.

Records Available—Discharge measurements and daily gauge heights from July, 1915, to September 30, 1917, were taken at the railway crossing 1.8 miles north and downstream from the present point of observation and measurement.

Drainage Area—1,260 square miles.

Gauge—Standard enamelled gauge plates 0-12 feet on the upstream side of the first pier from the left bank. Zero of the gauge is at an assumed elevation of 98.00 feet referred to a B.M. elev. 115.18, the top of an iron cap projecting above the floor of the bridge west of the west pier.

Channel and Control—The current is slow, but even across the section, and through one channel, away from the bridge, where discharge measurements are made when possible. Otherwise measurements are made from the bridge that breaks the flow into several channels.

Discharge Measurements—Made by current meter from the bridge, ice, or boat.

Regulation—There is no artificial control of the waters of this river above the section.

Accuracy—Logging operations have hampered metering during past year, and will more so in future.

Observer—T. Bourassa, Frederickhouse.

Discharge Measurements of Frederickhouse River at Frederickhouse for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Jan. 28.....	Taylor, J. R....	100	813	.64	100.90	620 (a)
Feb. 21.....	"	170	937	.50	100.46	470 (b)
April 11.....	"	162	958	.57	100.77	546 (b)
June 4.....	"	166	1,942	1.92	106.50	3,729 (c)
July 16.....	"	135	873	.42	99.65	364 (c)

(a) Ice measurement, section partly blocked by pulpwood and logs.

(b) Ice measurement.

(c) Log jam above section.

Daily Gauge Height in feet and Discharge in second-feet of Frederickhouse River at Frederickhouse for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	104.33	3070	104.67	3400	103.92	2610	102.17	1300	100.92	695	100.42	456	100.33	429	105.92	4690	107.33	6240	100.25	525	98.67	213	102.83	1860
2	104.83	3560	104.42	3150	103.75	2480	102.00	1210	100.83	655	100.50	480	100.17	388	105.92	4690	107.08	5960	100.25	525	98.67	213	102.75	1800
3	105.08	3800	104.17	2920	103.67	2410	102.08	1250	100.83	655	100.50	480	100.08	366	106.50	5320	106.67	5510	100.08	474	98.83	228	102.67	1740
4	105.33	4070	104.00	2760	103.67	2410	102.08	1250	100.92	695	100.50	480	100.00	350	107.50	6420	106.33	5140	99.92	426	98.75	220	102.58	1680
5	105.50	4240	103.93	2700	103.50	2280	102.17	1300	100.92	695	100.58	505	100.00	350	107.25	6150	106.17	4960	99.83	402	98.83	228	102.50	1630
6	105.50	4240	103.83	2620	103.50	2280	102.08	1250	100.92	695	100.58	505	100.17	388	107.50	6420	105.67	4420	99.75	382	98.83	228	102.50	1630
7	105.58	4330	103.83	2620	103.42	2220	102.08	1250	100.92	695	100.67	530	100.17	388	107.50	6420	105.42	4160	99.83	382	98.83	228	103.00	1980
8	105.75	4510	103.92	2690	103.33	2150	102.00	1210	100.92	695	100.75	560	100.50	480	107.75	6700	105.25	3980	99.75	382	98.92	237	103.58	2420
9	105.67	4420	104.00	2760	103.25	2090	102.00	1210	100.92	695	100.75	560	100.50	480	107.67	6610	105.00	3720	99.75	382	98.92	237	104.08	2830
10	105.42	4160	103.83	2620	103.25	2090	101.75	1080	100.83	655	100.83	585	101.25	745	107.75	6700	105.00	3720	99.75	382	99.00	245	104.42	3150
11	105.42	4160	103.67	2490	103.17	2030	101.67	1040	100.83	655	100.83	585	101.57	885	107.75	6700	104.67	3400	99.83	402	99.00	245	105.08	3800
12	105.33	4070	103.67	2490	103.00	1900	101.50	950	100.83	655	100.75	560	101.67	935	107.75	6700	104.58	3310	99.75	382	99.00	245	105.08	3800
13	105.08	3800	103.58	2420	103.00	1900	101.42	910	100.83	655	100.75	560	101.83	1020	107.75	6700	104.33	3070	99.83	402	98.92	237	105.42	4160
14	104.83	3560	103.50	2360	102.75	1660	101.33	870	100.75	630	100.67	530	102.08	1370	107.67	6610	104.25	2990	99.75	382	98.83	228	105.42	4160
15	104.67	3400	103.42	2290	102.67	1610	101.17	795	100.75	630	100.67	530	102.50	1630	107.58	6510	104.00	2760	99.67	364	98.75	220	104.92	3640
16	104.42	3150	103.33	2220	102.42	1450	101.17	795	100.67	600	100.58	505	103.00	1980	107.50	6420	103.75	2560	99.58	346	98.67	213	104.92	3640
17	104.25	2990	103.67	2490	102.17	1300	101.00	725	100.67	600	100.58	505	103.50	2360	107.42	6340	103.42	2290	99.33	296	98.67	213	104.92	3640
18	104.08	2830	104.08	2830	101.42	1170	101.00	725	100.58	555	100.50	480	104.08	2830	107.42	6340	103.17	2100	99.08	257	98.67	213	104.75	3480
19	104.08	2830	104.75	3480	101.67	1040	101.00	725	100.50	510	100.50	480	104.58	3310	107.33	6240	102.50	1630	99.08	257	99.00	245	104.58	3310
20	104.00	2760	104.67	3400	101.50	950	101.00	725	100.50	510	100.50	480	104.92	3640	107.42	6340	102.17	1420	99.00	245	99.08	257	104.75	3480
21	104.00	2760	104.42	3150	101.42	910	100.92	695	100.50	510	100.50	480	105.33	4070	107.50	6420	101.50	1050	98.83	228	99.17	270	104.83	3560
22	104.00	2760	104.33	3070	101.50	950	100.92	695	100.50	510	100.50	480	105.75	4510	107.75	6700	101.42	1010	98.75	220	99.42	314	104.92	3640
23	103.92	2690	104.33	3070	101.50	950	100.83	655	100.50	510	100.50	480	105.75	4510	108.25	7250	101.25	925	98.53	206	100.67	501	105.08	3800
24	104.17	2920	104.25	2900	101.50	950	100.92	695	100.50	510	100.50	480	105.75	4510	108.58	7610	101.08	845	98.50	200	100.67	501	105.17	3900
25	104.58	3310	104.00	2680	101.75	1080	100.83	655	100.50	510	100.50	480	105.75	4510	108.42	7440	101.00	810	98.75	220	101.08	845	105.33	4070
26	105.00	3720	103.67	2410	101.75	1080	100.83	655	100.50	510	100.50	480	105.75	4510	108.25	7250	100.58	640	98.92	237	101.42	1010	105.42	4160
27	105.33	4070	104.00	2680	102.17	1300	100.83	655	100.50	480	100.50	480	105.75	4510	107.83	6790	100.58	640	98.92	237	101.67	1140	104.92	3640
28	105.50	4240	104.08	2740	.....	1330	100.92	695	100.42	456	100.50	480	105.83	4590	107.83	6790	100.50	610	99.00	245	101.83	1230	104.83	3560
29	105.25	3980	104.00	2680	102.25	1350	100.83	655	.....	.....	100.42	456	105.83	4590	107.75	6700	100.50	610	98.92	237	102.42	1580	104.75	3480
30	105.00	3720	104.00	2680	102.17	1300	100.83	655	.....	.....	100.33	429	105.83	4590	107.67	6610	100.33	550	98.83	228	102.75	1800	104.67	3400
31	105.00	3720	.....	.....	102.17	1300	100.92	695	.....	.....	100.33	429	.....	.....	107.67	6610	.....	.....	98.75	220	102.92	1920	.....	.....

**Monthly Discharge of Frederickhouse River at Frederickhouse
for year ending September 30th, 1919**

Drainage Area, 1,260 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in inches on Drainage Area
October (1918)	4,510	2,690	3,608	3.58	2.13	2.86	3.30
November "	3,400	2,220	2,759	2.70	1.76	2.19	2.44
December "	2,610	910	1,630	2.07	.72	1.29	1.49
January .. (1919)	1,300	655	902	1.03	.52	.72	.83
February	695	456	600	.55	.36	.48	.50
March	585	429	500	.46	.34	.40	.46
April	4,590	350	2,312	3.64	.28	1.83	2.04
May	7,610	4,690	6,499	6.04	3.72	5.16	5.95
June	6,240	550	2,712	4.95	.44	2.15	2.40
July	525	200	326	.42	.16	.26	.30
August	1,920	213	512	1.52	.17	.41	.47
September	4,510	1,630	3,174	3.58	1.29	2.52	2.81
The year	7,610	200	2,134	6.04	.16	1.69	23.00

Kapuskasing River at Kapuskasing

Location—About 500 feet downstream from the C. G. Railway's bridge, and 300 feet upstream from the C.N. Ry.'s pump-house in the Village of Kapuskasing.

Records Available—Discharge measurement from March 23rd, 1918, gauge heights from May 10th, 1918.

Drainage Area—2,820 square miles.

Gauge—A chain gauge consisting of weight held by chain, and four plates of H.E.P.C. standard gauge, has been installed. The gauge is located 75 feet upstream from the section. The initial point for soundings is a track spike driven in a 16-inch cedar tree on the north bank.

Channel and Control—The channel is straight for 300 feet above and below the section. A small island exists at low water 75 feet below the section. The banks are high, rocky, slightly wooded, and are not liable to overflow. The bed of the river consists of clean rock and is permanent.

Discharge Measurements—Made from a boat with a small Price current meter.

Winter Flow—The rating curve is affected by ice and measurements are taken to determine the flow.

Observer—J. Ferguson, Kapuskasing, Ontario.

Discharge Measurements of Kapuskasing River at Kapuskasing for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Jan. 29.....	Taylor, J. R....	306	1,450	.76	676.40	1,110 (a)
Feb. 23.....	".....	306	1,249	.63	676.02	792 (a)
April 13.....	".....	312	2,194	1.35	678.30	2,958 (a)
May 29.....	".....	319	3,415	2.37	681.83	8,070
July 18.....	".....	302	1,462	.55	675.55	806
Aug. 27.....	".....	304	1,734	.86	676.42	1,493

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Kapuskasing River at Kapuskasing for year
ending September 30th, 1919

Date	October			November			December			January			February			March			April			May			June			July			August			September																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.	Gauge Ht.	Dis- charge Ht.	Sec-ft.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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Monthly Discharge of Kapuskasing River at Kapuskasing for year ending September 30th, 1919

Drainage Area, 2,820 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October ..(1918).	3,430	2,070	2,586	1.22	.73	.92	1.06
November ..	5,950	2,900	3,709	2.11	1.03	1.32	1.47
December ..	3,040	975	1,898	1.08	.35	.67	.77
January ..(1919).	1,150	910	1,022	.41	.32	.36	.42
February	940	685	808	.33	.24	.29	.30
March.....	805	600	706	.29	.21	.25	.29
April	9,650	610	4,349	3.42	.22	1.54	1.72
May.....	10,150	6,220	8,019	3.60	2.21	2.84	3.27
June	6,120	1,140	3,008	2.18	.40	1.07	1.19
July.....	1,100	595	755	.39	.21	.27	.31
August	1,530	495	768	.54	.18	.27	.31
September.....	4,750	950	2,749	1.68	.34	.97	1.08
The year	10,150	495	2,535	3.60	.18	.90	12.20

Mattagami River at Smooth Rock Falls

Location—Lot 23, concession XI, Township of Kendry, Timiskaming District. About one mile below the plant of the Mattagami Pulp and Paper Co. at Smooth Rock Falls.

Records Available—The Mattagami Pulp and Paper Co. take readings of the water below their plant, from which it is expected estimates of flow may be made when a curve is defined.

Drainage Area—3,970 square miles.

Gauge—A chain gauge is installed reading zero with the elevation of the water at 707.00, referred to a B.M. elev. 725.04. The B.M. is 10 feet S.W of the initial point for soundings the head of a nail driven in a blazed and painted tree.

Channel and Control—A well-defined, evenly distributed current exists at all times. There is but one channel at all stages. Extreme high water is not likely to go over the river banks at this spot. The control point is not well defined, or as yet has not been ascertained.

Regulation—Extensive storage works have been constructed for the purposes of regulating the headwaters of the river for the benefit of power plants.

Discharge Measurements—Made by current meter from a boat or the ice.

Winter Flow—The amount of ice effect on discharge is not yet determined, but will be considerable.

Discharge Measurements of Mattagami River at Smooth Rock Falls for year ending September 30th. 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
February 22.....	Taylor, J. R....	409	3,611	.61	710.65	2,188 (a)
June 5.....	.. ....	399	4,441	1.38	712.78	6,130
July 24.....	.. ....	385	3,224	.58	709.20	1,879

(a) Ice measurement.

Mississagi River at Iron Bridge

Location—At highway bridge in the village of Iron Bridge, south half of lot 3, concession 2, Township of Gladstone, District of Algoma.

Records Available—Discharge measurements from September, 1915. Daily gauge heights from November 16, 1915, to October 1st, 1919.

Drainage Area—3,565 square miles.

Gauge—Vertical steel staff with enamelled face graduated in feet and inches, 0 to 6 foot section placed on pile on left shore 350 feet down stream from bridge, 6 to 12 foot section placed on down stream side of right abutment of bridge. Zero of the gauge (elev. 30.00) referred to bench mark (elev. 55.50 feet) on top of right abutment down stream side.

Channel—Straight for about 300 feet above and about 1 mile below the gauging station. The bed of the stream consists of clay and sand, slightly shifting.

Discharge Measurements—Made from highway bridge with small Price current meter.

Control—About eleven miles below the gauging station there is a small falls and rapids known as the Mississagi rapids. Log jams sometimes occur on these rapids during low water period, which may cause back water at the gauging station.

Winter Flow—During the winter months measurements are made through the ice to determine the winter flow. The relation of gauge height to discharge is seriously affected by ice.

Accuracy—There is a slight back flow at the west end of the section during low stages.

Observer—Nelson Warnock, Iron Bridge.

Discharge Measurements of Mississagi River at Iron Bridge for year
ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
October 23.....	Taylor, J. R....	178	2,835	1.43	33.75	4,048
November 28.....	Loy, R.....	182	3,466	2.53	37.33	8,761
December 21.....	Taylor, J. R....	180	3,049	1.50	34.87	4,587 (a)
1919						
February 27.....	"	235	2,512	.69	32.83	1,735 (a)
March 18.....	"	227	2,630	.78	33.58	2,067 (a)
April 23.....	"	193	4,821	3.19	43.81	15,391

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second feet of Mississippi River at Iron Bridge for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	32.00	2550	36.67	7750	36.25	7020	36.50	6400	33.67	2850	32.96	1960	33.83	4120	39.92	12430	36.08	6940	34.08	4920	30.92	1450	31.04	1450
2	31.92	2460	36.42	7450	36.21	6980	36.50	6400	33.62	2790	33.00	2000	33.83	4120	40.33	13270	35.92	6400	33.54	4000	30.87	1390	31.00	1390
3	31.87	2410	36.12	7100	36.08	6830	36.50	6400	33.54	2700	33.04	2040	33.83	4120	40.54	13730	35.83	6280	33.25	5050	30.83	1390	30.96	1390
4	31.83	2360	35.83	6770	36.00	6740	36.25	6120	33.67	2850	33.04	2040	33.17	3620	40.62	13900	35.62	6280	33.00	3160	30.79	1390	30.92	1390
5	32.08	2640	35.54	6440	35.83	6320	36.00	5858	33.67	2850	33.08	2090	33.33	3790	40.54	13730	35.29	5780	32.79	3060	30.75	1320	30.87	1320
6	32.62	3230	35.33	6210	37.00	7060	36.08	5940	33.54	2700	33.00	2000	35.00	5630	40.54	13730	34.92	5050	32.83	3060	30.71	1260	30.83	1320
7	33.00	3650	35.25	6120	37.92	8780	36.25	6120	33.50	2660	33.00	2000	36.08	6830	40.50	13640	35.58	5640	32.83	3460	30.67	1260	30.81	1320
8	33.58	4290	35.46	6360	37.75	8570	36.21	6080	33.46	2620	33.00	2000	35.92	6870	39.83	12260	36.25	6160	32.75	2860	30.60	1200	30.75	1320
9	33.83	4560	35.96	6820	37.29	8010	36.00	5850	33.29	2430	33.00	2000	35.92	6870	39.83	12260	36.25	6160	32.58	2860	30.54	1140	30.73	1320
10	33.92	4660	36.17	7160	37.08	7760	36.58	6490	33.17	2300	32.96	1960	36.33	7340	39.50	11670	36.79	7620	32.37	2780	30.48	1080	30.73	1260
11	33.83	4560	36.12	7210	37.50	8020	35.50	5080	33.17	2300	32.92	1910	40.25	13100	39.25	10700	36.83	8040	32.29	2590	30.48	1140	30.73	1200
12	33.75	4480	36.12	7100	37.75	8320	35.29	4850	33.23	2360	32.92	1910	41.50	16000	38.75	10250	36.67	8020	32.21	2410	30.46	1080	30.71	1200
13	33.83	4560	36.08	7060	37.37	7870	35.25	4800	33.31	2450	32.87	1860	42.00	17220	38.33	9520	36.33	7870	32.12	2410	30.46	1080	30.71	1140
14	33.83	4560	36.00	6960	37.08	7520	35.25	4800	33.31	2450	32.79	1770	42.25	17830	38.00	9070	36.50	7280	32.00	2330	30.46	1140	31.08	1320
15	33.75	4480	35.79	6720	36.42	6530	35.27	4830	33.25	2380	32.79	1770	41.83	16800	37.75	8760	36.50	7680	31.92	2250	30.62	1140	31.19	1320
16	33.67	4390	35.67	6590	36.21	6300	35.08	4620	33.17	2390	33.04	2040	41.08	15580	37.42	8320	36.29	7960	31.83	2080	30.71	1140	31.17	1590
17	33.58	4290	35.00	6960	35.75	5800	35.00	4530	33.08	2200	33.29	2320	41.08	14970	37.92	8630	36.50	7800	31.75	2010	30.75	1200	31.17	1510
18	33.50	4200	36.92	8050	35.58	5610	34.92	4440	33.06	2180	33.58	2640	40.83	14370	38.75	9660	35.92	7200	31.71	1930	30.73	1260	31.12	1450
19	33.58	4290	38.04	9450	35.17	5160	34.92	4440	33.00	2110	33.83	3460	40.75	14190	39.08	10700	35.67	6800	31.58	1930	30.75	1260	31.04	1510
20	33.67	4390	39.33	11380	35.08	4840	34.67	4170	33.00	2110	33.83	3460	41.17	15190	39.42	11010	35.50	7070	31.58	1930	30.81	1200	31.00	1450
21	33.75	4480	39.67	11970	34.87	4610	34.62	4110	33.00	2110	34.33	4010	43.33	20480	39.50	11150	35.00	6800	31.62	1790	30.84	1260	31.08	1510
22	33.75	4480	39.54	11740	35.17	4940	34.54	4020	33.00	2110	34.29	3970	43.83	21700	39.17	11010	34.92	6400	31.62	1790	30.84	1260	31.08	1510
23	33.75	4480	39.25	11250	35.50	5300	34.50	3980	33.00	2110	34.29	3970	43.83	21700	39.00	10700	34.83	5400	31.58	2010	30.92	1260	31.83	1750
24	33.79	4520	38.83	10600	35.25	5020	34.33	3790	32.96	2070	34.29	3970	44.00	22120	38.79	10250	35.00	6160	31.54	1930	30.87	1320	32.12	2030
25	34.58	5390	38.50	10100	36.25	6120	34.12	3560	32.96	2070	34.42	4110	43.75	21510	38.42	9800	35.08	5900	31.46	1860	31.08	1320	32.58	2330
26	35.50	6400	38.00	9500	37.17	7160	34.14	3580	32.96	2070	34.58	4620	43.00	19670	37.92	9070	34.92	5780	31.37	1790	31.08	1450	33.00	2570
27	35.75	6680	37.62	8910	37.37	7390	34.14	3580	32.83	1810	34.83	4890	42.00	17220	37.67	8620	34.67	5400	.....	1710	31.08	1510	33.33	3000
28	36.42	7450	37.33	8550	37.37	7390	34.06	3500	32.87	1860	34.75	4860	41.46	15900	37.33	8330	34.58	5400	.....	1650	31.04	1450	33.33	3180
29	37.08	8240	36.92	7930	37.48	7520	34.04	3470	.....	.....	34.62	4600	41.00	14770	37.08	7900	34.67	5270	.....	1510	31.00	1450	33.58	3160
30	37.00	8140	36.67	7630	37.00	6960	33.92	3340	.....	.....	34.46	4490	40.58	13820	36.71	7620	34.50	5160	.....	1510	31.00	1450	33.92	3260
31	36.92	8050	.....	.....	36.67	6590	33.87	3290	.....	.....	34.08	4070	.....	.....	36.33	6800	.....	.....	.....	1450	31.00	1390	.....	.....

NOTE.—Flow estimates from May 11th, based on flow at O'Neill's Farm Section.

Monthly Discharge of Mississagi River at Iron Bridge for year ending
September 30th, 1919

Drainage Area, 3,565 Square Miles.

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	8,240	2,360	4,687	2.31	.66	1.31	1.51
November "	11,970	6,120	8,131	3.36	1.71	2.28	2.54
December "	8,780	4,610	6,763	2.46	1.29	1.88	2.17
January (1919)	6,490	3,290	4,788	1.82	.92	1.34	1.54
February.....	2,850	1,810	2,349	.80	.51	.66	.69
March.....	4,890	1,770	2,938	1.37	.50	.82	.94
April.....	22,120	3,620	13,238	6.20	1.02	3.71	4.14
May	13,900	6,800	10,618	3.90	1.91	2.98	3.44
June	8,040	5,050	6,545	2.26	1.42	1.84	2.05
July.....	5,050	1,450	2,459	1.42	.41	.69	.80
August.....	1,450	1,080	1,281	.41	.30	.36	.42
September.....	3,260	1,140	1,720	.91	.32	.48	.54
The year.	22,120	1,080	5,464	6.20	.30	1.53	20.81

Mississagi River at O'Neil's Farm

Location—Near lot 6, Township of Thompson, District of Algoma, $3\frac{1}{2}$ miles downstream from Iron Bridge and $1\frac{1}{2}$ miles above the steel bridge at Mississagi P.O.

Records Available—Discharge measurements from May, 1919, and daily gauge readings from May 11th, 1919.

Drainage Area—3,640 square miles.

Gauge—Chain gauge consisting of chain and four plates of standard gauge plating, reading 0-12 ft. Gauge zero, elev. 85.00, referred to B.M., elev. 100.00, consisting of three 6" spikes driven into root of blazed elm tree.

Channel—Straight for 100 feet above and about one mile below widening out about 300 feet below section. Both banks are wooded. There is one channel at ordinary stages and two channels at extreme high water.

Discharge Measurements—Made from boat with small Price current meter.

Control—There is considerable log driving done on this river and a jam below the section would affect the discharge.

Winter Flow—There will likely be some ice effect as the section will partly freeze over.

Observer—Sam. O'Neil, Dean Lake.

Discharge Measurements of Mississagi River at O'Neil's Farm for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
May 9.....	Taylor, J. R.	240	4,208	2.91	93.17	12,231
June 17.....	"	236	3,340	1.63	90.48	5,463
July 29.....	Loy, R	220	2,487	.52	85.83	1,292
Sept. 29.....	Taylor, J. R.	228	2,694	1.34	87.50	3,612

Daily Gauge Height in feet of Mississagi River at O'Neil's Farm for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	88.83	90.17	88.83	90.17	88.83	90.17	88.83	90.17	88.83	90.17	88.83	90.17	88.83	90.17	88.83	90.17	88.83	90.17	88.83	90.17	88.83	90.17	88.83	90.17
2	88.17	89.83	88.17	89.83	88.17	89.83	88.17	89.83	88.17	89.83	88.17	89.83	88.17	89.83	88.17	89.83	88.17	89.83	88.17	89.83	88.17	89.83	88.17	89.83
3	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75
4	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75
5	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75	85.67	89.75
6	87.42	89.42	87.42	89.42	87.42	89.42	87.42	89.42	87.42	89.42	87.42	89.42	87.42	89.42	87.42	89.42	87.42	89.42	87.42	89.42	87.42	89.42	87.42	89.42
7	85.58	88.92	85.58	88.92	85.58	88.92	85.58	88.92	85.58	88.92	85.58	88.92	85.58	88.92	85.58	88.92	85.58	88.92	85.58	88.92	85.58	88.92	85.58	88.92
8	85.58	89.33	85.58	89.33	85.58	89.33	85.58	89.33	85.58	89.33	85.58	89.33	85.58	89.33	85.58	89.33	85.58	89.33	85.58	89.33	85.58	89.33	85.58	89.33
9	87.75	89.67	87.75	89.67	87.75	89.67	87.75	89.67	87.75	89.67	87.75	89.67	87.75	89.67	87.75	89.67	87.75	89.67	87.75	89.67	87.75	89.67	87.75	89.67
10	87.25	90.08	87.25	90.08	87.25	90.08	87.25	90.08	87.25	90.08	87.25	90.08	87.25	90.08	87.25	90.08	87.25	90.08	87.25	90.08	87.25	90.08	87.25	90.08
11	85.58	90.58	85.58	90.58	85.58	90.58	85.58	90.58	85.58	90.58	85.58	90.58	85.58	90.58	85.58	90.58	85.58	90.58	85.58	90.58	85.58	90.58	85.58	90.58
12	87.00	90.83	87.00	90.83	87.00	90.83	87.00	90.83	87.00	90.83	87.00	90.83	87.00	90.83	87.00	90.83	87.00	90.83	87.00	90.83	87.00	90.83	87.00	90.83
13	86.83	90.82	86.83	90.82	86.83	90.82	86.83	90.82	86.83	90.82	86.83	90.82	86.83	90.82	86.83	90.82	86.83	90.82	86.83	90.82	86.83	90.82	86.83	90.82
14	85.33	90.73	85.33	90.73	85.33	90.73	85.33	90.73	85.33	90.73	85.33	90.73	85.33	90.73	85.33	90.73	85.33	90.73	85.33	90.73	85.33	90.73	85.33	90.73
15	86.75	90.38	86.75	90.38	86.75	90.38	86.75	90.38	86.75	90.38	86.75	90.38	86.75	90.38	86.75	90.38	86.75	90.38	86.75	90.38	86.75	90.38	86.75	90.38
16	86.67	90.62	86.67	90.62	86.67	90.62	86.67	90.62	86.67	90.62	86.67	90.62	86.67	90.62	86.67	90.62	86.67	90.62	86.67	90.62	86.67	90.62	86.67	90.62
17	85.33	91.00	85.33	91.00	85.33	91.00	85.33	91.00	85.33	91.00	85.33	91.00	85.33	91.00	85.33	91.00	85.33	91.00	85.33	91.00	85.33	91.00	85.33	91.00
18	86.42	90.69	86.42	90.69	86.42	90.69	86.42	90.69	86.42	90.69	86.42	90.69	86.42	90.69	86.42	90.69	86.42	90.69	86.42	90.69	86.42	90.69	86.42	90.69
19	86.33	91.75	86.33	91.75	86.33	91.75	86.33	91.75	86.33	91.75	86.33	91.75	86.33	91.75	86.33	91.75	86.33	91.75	86.33	91.75	86.33	91.75	86.33	91.75
20	85.50	90.08	85.50	90.08	85.50	90.08	85.50	90.08	85.50	90.08	85.50	90.08	85.50	90.08	85.50	90.08	85.50	90.08	85.50	90.08	85.50	90.08	85.50	90.08
21	85.42	92.58	85.42	92.58	85.42	92.58	85.42	92.58	85.42	92.58	85.42	92.58	85.42	92.58	85.42	92.58	85.42	92.58	85.42	92.58	85.42	92.58	85.42	92.58
22	86.17	92.50	86.17	92.50	86.17	92.50	86.17	92.50	86.17	92.50	86.17	92.50	86.17	92.50	86.17	92.50	86.17	92.50	86.17	92.50	86.17	92.50	86.17	92.50
23	85.83	92.50	85.83	92.50	85.83	92.50	85.83	92.50	85.83	92.50	85.83	92.50	85.83	92.50	85.83	92.50	85.83	92.50	85.83	92.50	85.83	92.50	85.83	92.50
24	86.42	92.33	86.42	92.33	86.42	92.33	86.42	92.33	86.42	92.33	86.42	92.33	86.42	92.33	86.42	92.33	86.42	92.33	86.42	92.33	86.42	92.33	86.42	92.33
25	85.58	91.83	85.58	91.83	85.58	91.83	85.58	91.83	85.58	91.83	85.58	91.83	85.58	91.83	85.58	91.83	85.58	91.83	85.58	91.83	85.58	91.83	85.58	91.83
26	86.17	91.42	86.17	91.42	86.17	91.42	86.17	91.42	86.17	91.42	86.17	91.42	86.17	91.42	86.17	91.42	86.17	91.42	86.17	91.42	86.17	91.42	86.17	91.42
27	86.08	91.17	86.08	91.17	86.08	91.17	86.08	91.17	86.08	91.17	86.08	91.17	86.08	91.17	86.08	91.17	86.08	91.17	86.08	91.17	86.08	91.17	86.08	91.17
28	85.83	91.00	85.83	91.00	85.83	91.00	85.83	91.00	85.83	91.00	85.83	91.00	85.83	91.00	85.83	91.00	85.83	91.00	85.83	91.00	85.83	91.00	85.83	91.00
29	85.75	90.75	85.75	90.75	85.75	90.75	85.75	90.75	85.75	90.75	85.75	90.75	85.75	90.75	85.75	90.75	85.75	90.75	85.75	90.75	85.75	90.75	85.75	90.75
30	85.83	90.08	85.83	90.08	85.83	90.08	85.83	90.08	85.83	90.08	85.83	90.08	85.83	90.08	85.83	90.08	85.83	90.08	85.83	90.08	85.83	90.08	85.83	90.08
31	85.75	90.08	85.75	90.08	85.75	90.08	85.75	90.08	85.75	90.08	85.75	90.08	85.75	90.08	85.75	90.08	85.75	90.08	85.75	90.08	85.75	90.08	85.75	90.08

South River at Cox's Chute

Location—150 feet above the last of Cox's Chutes, four miles west of the Town of Trout Creek, near Lot 35, Concession 2, Township of Himsworth, District of Parry Sound.

Records Available—Discharge measurements from December, 1918, and daily gauge readings from December 5th, 1918.

Drainage Area—166 square miles.

Gauge—Chain gauge installed on right bank directly above section. Zero=92.86 referred to a B.M. assumed elevation 100.00 on 4" spruce tree.

Channel and Control—Channel above station straight for about 60 feet widening out into large pool. Below station straight to head of falls, there dividing into two channels. Water swift at all times. Right bank is high and left bank is low but not liable to overflow. Both banks are wooded; logs may jam at falls below section and affect discharge.

Discharge Measurements—Made from bridge with small Price Current meter suspended by cable.

Winter Flow—Ice conditions will affect the relation of gauge height to discharge.

Observer—W. Freeman, Trout Creek.

Discharge Measurements of South River at Cox's Chute for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Fect
1919						
February 13	Taylor, J. R.....	20	48	2.41	93.86	115
March 31	"	33	108	4.78	96.00	515
July 10	"	21	42	1.83	93.42	78
September 23	"	20	46	1.99	93.68	92

South River near Powassan

Location—75 feet below "Gough's" highway bridge on the Nipissing village road 2.5 miles northwest of Powassan station and at the farm owned by Owen Gough between lots 20 and 21 and 14th and 15th concessions in the Township of Hims-worth, in the District of Parry Sound.

Records Available—Discharge measurements from July 6, 1917, and before then at "Healey's" bridge. Daily gauge heights from March 11, 1914.

Drainage Area—294 square miles.

Gauge—Standard enamelled gauge plates 0-12 feet on the northwest corner of the left abutment. Elevation of the zero of the gauge 22.76 feet is referred to a B.M. elevation assumed 56.15 feet painted on the top of a corner of barn foundation 350 feet from the section.

Channel—Straight for about 200 feet above and 150 feet below the metering section. With high water conditions both banks are liable to overflow. The bed is largely composed of soft, black muck, likely to shift under high velocities.

Discharge Measurements—Made with current meter from a boat at a section 100 feet below the bridge.

Winter Flow—Measurements made through ice in the winter. Ordinary relations between gauge heights and discharge are seriously disturbed by ice conditions, and measurements are made in the winter to determine this effect.

Accuracy—A fairly well defined rating curve has been established.

Observer—Owen Gough, Powassan.

Discharge Measurements of South River near Powassan for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
October 11.....	1918 Taylor, J. R.....	100	578	.76	26.05	437
November 26.....	Loy, R. P.....	90	580	.80	26.01	461
December 31.....	".....	90	531	.78	25.93	412 (a)
February 15.....	1919 Taylor, J. R....	73	349	.48	24.68	169 (a)
March 12.....	Loy, R. P.....	78	350	.49	24.47	171 (a)
May 28.....	".....	94	756	1.22	28.34	919
July 11.....	Taylor, J. R....	81	407	.20	23.84	80
September 23.....	".....	87	464	.42	24.79	197

(a) Ice measurement.

**Monthly Discharge of South River near Powassan for year ending
September. 30th, 1919**

Drainage Area, 294 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October... (1918)	995	229	521	3.38	.78	1.77	2.04
November. "	1,100	315	555	3.74	1.07	1.89	2.11
December "	1,150	283	445	3.91	.96	1.51	1.74
January .. (1919)	365	214	264	1.24	.73	.90	1.04
February	226	137	168	.77	.47	.57	.59
March	1,640	136	652	5.58	.46	2.22	2.56
April	1,740	650	1,100	5.92	2.21	3.74	4.17
May	1,720	495	882	5.85	1.68	3.00	3.46
June	890	83	370	3.02	.28	1.26	1.41
July	95	68	82	.32	.23	.28	.32
August	269	75	127	.91	.26	.43	.50
September	290	68	124	.99	.23	.42	.47
The year	1,740	68	442	5.92	.23	1.50	20.40

Spanish River at Webbwood

Location—On the highway bridge about one mile east of Webbwood station on the Sault Branch of the C.P.R. and eight miles below Espanola Mills.

Records Available—Gauge readings daily from February 1, 1917. Discharge measurements monthly from January, 1917.

Drainage Area—4,340 square miles.

Gauge—Vertical steel staff gauge 0-12 feet on south side of 2nd pier from right bank. Zero, 36.00, referred to B.M. elev. 45.70, on south-east corner of 1st pier.

Channel—The approach to the bridge is straight for 300 feet above, and below the bridge for one-half mile.

Discharge Measurements—During the open water season the measurements are made from the bridge and boat. During the winter season the measurements are made from the ice under the bridge.

Winter Flow—The relation between gauge readings and discharge is seriously disturbed during the winter months.

Regulation—The Spanish River Pulp and Paper Co. operate a plant at Espanola, eight miles above the section, which is partly shut down on Sundays, accounting for the fluctuation in gauge heights at the week ends. This company also has storage dams at various locations on the headwaters of this river for conserving the flow for both lumber and power purposes.

Observer—D. J. Stewart, Webbwood.

Discharge Measurements of Spanish River at Webbwood for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Feb. 28.....	Taylor, J. R.....	202	2,962	.98	38.17	2,899 (a)
Mar. 17.....	“ ..	197	2,896	1.18	38.45	3,423 (a)
May 1.....	“ ..	275	5,600	2.98	45.21	16,698
July 28.....	Loy, R. P.	228	3,895	.81	38.37	3,171
Sept. 30.....	Taylor, J. R.....	230	4,002	1.16	38.61	4,633

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Spanish River at Webbwood for year ending
September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
1	37.83	2650	41.58	9020	41.75	8560	40.17	5280	38.75	3060	39.00	3420	41.42	8700	45.25	17320	43.42	13130	38.58	3690	37.83	2650	38.50	3570
2	37.75	2560	41.33	8520	41.58	8220	40.00	4990	37.67	2060	37.58	2010	40.17	6330	45.17	17330	43.75	13920	38.50	3570	37.75	2560	38.42	3450
3	37.92	2760	41.00	7860	41.58	8220	39.75	4580	38.50	2730	38.25	2460	40.17	6330	45.00	16920	43.00	12150	38.42	3450	37.58	2400	38.42	3450
4	38.00	2860	41.42	8700	41.50	8060	39.67	4450	38.42	2730	38.08	2330	39.75	5880	44.25	15120	42.50	11000	38.33	3320	38.25	3200	38.17	3090
5	38.33	3320	40.83	7540	41.50	8060	39.08	3540	38.50	2730	38.00	2270	39.50	5160	44.33	15310	42.32	10820	38.33	3320	38.00	2860	38.00	2860
6	37.42	2280	40.50	6920	41.25	7580	39.17	3680	38.50	2730	38.00	2370	39.67	5450	44.25	15120	42.83	11760	37.58	2400	37.83	2650	38.25	3200
7	38.17	3090	39.75	5580	41.00	7100	39.33	3920	38.33	2540	38.33	2550	42.50	11000	44.42	15330	42.83	11760	37.58	2400	37.67	2480	37.75	2560
8	38.42	3450	40.33	6610	40.50	6200	39.42	4050	38.25	2460	38.50	2730	43.42	13130	44.75	16320	42.67	11390	37.67	2480	37.50	2340	37.75	2560
9	38.25	3200	40.67	7230	40.92	6960	39.25	3800	36.67	1660	37.17	1820	43.92	14330	44.92	16730	42.25	10450	37.67	2480	37.33	2220	37.58	2400
10	38.25	3200	40.08	6160	40.42	6060	39.17	3680	38.33	2540	38.25	2460	44.42	15550	44.92	16730	42.00	9900	37.75	2560	36.50	1790	37.83	2650
11	38.33	3320	40.50	6920	40.67	6510	39.00	3420	38.00	2270	38.17	2400	46.25	19920	44.33	15310	41.75	9380	37.67	2480	36.83	1940	37.83	2650
12	38.42	3450	40.33	6610	40.33	5890	38.33	2540	37.83	2160	38.17	2400	47.25	22320	44.83	16510	40.17	6330	37.75	2560	37.33	2220	37.50	2340
13	38.08	2960	40.33	6610	40.25	5760	38.50	2730	37.67	2060	38.00	2270	.....	.....	44.83	16510	40.17	6330	37.75	2560	37.33	2220	36.17	1680
14	37.83	2650	40.00	6020	40.08	5470	38.58	2830	37.83	2160	38.00	2270	.....	.....	44.83	16510	40.00	6020	37.58	2400	37.33	2220	37.83	2650
15	37.67	2480	39.83	5720	40.58	6340	38.50	2730	36.67	1660	36.65	1680	.....	.....	43.50	13320	40.42	6780	37.75	2560	37.58	2400	37.83	2650
16	37.58	2400	39.25	4740	40.42	6060	38.42	2630	38.17	2400	38.50	2730	47.83	23710	44.17	14930	40.42	6780	37.75	2560	37.58	2400	37.83	2650
17	37.58	2400	38.33	5320	40.25	5760	38.25	2460	38.00	2270	39.00	3420	47.50	22920	45.92	19130	40.33	6610	37.58	2400	36.33	1730	37.83	2650
18	37.58	2400	41.08	8020	40.25	5760	38.25	2460	38.00	2270	39.33	3920	47.33	22510	45.50	18120	40.42	6780	37.58	2400	37.33	2220	38.33	3320
19	37.42	2280	43.17	12540	40.33	5890	36.67	1660	38.17	2400	39.83	4710	46.92	21530	44.33	15310	40.50	6920	36.58	1820	37.17	2120	38.50	3570
20	37.08	2070	43.25	12720	40.42	6060	38.42	2630	37.83	2160	40.00	6020	47.25	22320	44.83	16510	40.50	6920	37.08	2070	38.50	3570	36.67	1860
21	37.50	2340	43.17	12080	40.92	6960	38.25	2460	38.00	2270	40.83	7540	48.00	24120	45.08	17110	39.17	4610	37.33	2220	38.75	3940	37.83	2650
22	37.50	2340	43.08	11870	41.00	7100	38.08	2330	37.83	2160	40.00	6020	.....	.....	45.42	17930	38.83	4070	37.33	2220	38.17	3090	37.75	2560
23	37.67	2480	43.08	11870	41.50	8060	38.08	2330	36.75	1680	40.33	6610	47.75	23520	45.50	18120	38.75	3940	37.25	2170	37.08	2070	37.67	2480
24	37.83	2650	42.83	11300	41.50	8060	38.08	2330	38.33	2540	41.33	8520	47.33	22510	45.83	18910	38.75	3940	37.00	2020	37.50	2340	37.83	2650
25	39.75	5580	43.50	12840	41.42	7900	38.08	2330	38.33	2540	41.00	7860	47.08	21910	46.42	20330	38.58	3690	36.83	1940	37.42	2280	37.83	2650
26	42.00	9900	43.00	11690	41.50	8060	36.75	1680	38.33	2540	41.42	8700	47.08	21910	46.42	20330	38.58	3690	36.83	1940	37.42	2280	37.83	2650
27	42.08	10080	42.67	10930	41.50	8060	38.00	2270	38.33	2540	41.58	8860	46.33	20110	46.75	21120	38.42	3450	38.33	3320	37.58	2400	38.17	3090
28	41.83	9540	42.58	10740	41.83	8720	38.08	2330	38.17	2400	41.58	9020	46.00	19320	46.33	20110	38.58	3690	38.33	3320	37.58	2400	37.67	2480
29	41.92	9730	42.50	10560	41.42	7900	38.08	2330	.....	.....	41.58	9020	45.67	18530	45.50	18120	38.75	3940	38.00	2860	37.58	2400	37.83	2650
30	41.50	8860	42.33	10190	41.00	7100	38.00	2270	.....	.....	40.75	7390	45.42	17930	44.17	14930	38.75	3940	37.83	2650	37.58	2400	38.00	2860
31	41.50	8860	.....	.....	40.42	6060	38.92	3300	.....	.....	42.00	9900	.....	.....	43.75	13920	.....	.....	37.83	2650	37.83	2650	.....	.....

Monthly Discharge of Spanish River at Webbwood for year ending
September 30th, 1919

Drainage Area, 4,340 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	10,080	2,070	4,136	2.32	.48	.95	1.10
November "	12,840	3,320	8,714	2.96	.76	2.01	2.24
December "	8,720	5,470	7,067	2.01	1.26	1.63	1.88
January (1919)	5,280	1,660	3,045	1.22	.38	.70	.81
February	3,060	1,660	2,340	.71	.38	.54	.56
March	9,900	1,680	4,572	2.28	.39	1.05	1.21
April	23,710	5,160	16,589	5.46	1.19	3.82	4.26
May	21,120	13,320	16,792	4.87	3.07	3.87	4.46
June	13,920	3,450	7,613	3.21	.79	1.75	1.95
July	3,690	1,730	2,564	.85	.40	.59	.68
August	3,940	1,730	2,479	.91	.40	.57	.66
September	3,570	1,680	2,717	.82	.39	.63	.70
The year	23,710	1,660	6,561	5.46	.38	1.51	20.52

Sturgeon River at Smoky Falls

Location—75 feet upstream from the highway bridge at Smoky Falls Post Office, and two miles above the Smoky Falls, Township of Field, Nipissing District.

Records Available—Discharge measurements from August, 1912. Daily gauge heights, January 12 to 31, 1914, and from March 15, 1914.

Drainage Area—2,570 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, and attached to a wooden pile on the right, upstream side of the bridge. The zero of the gauge (elevation 32.00) is referred to a bench mark (elevation 53.47) painted on a rock on the right bank of the river, about 175 feet above the bridge.

Channel—Straight for about 700 feet above and about 1 mile below the station. The banks are fairly high, clean, sandy and not liable to overflow. The bed of the stream is composed of clay and sand, slightly shifting. The current is fast and smooth.

Discharge Measurements—Made from boat during all stages.

Winter Flow—During the winter months the river is covered with ice, and measurements are made through the ice to determine the winter discharge. The relation of gauge height to discharge is seriously affected by ice.

Regulation—Dams above are used for storage and log driving purposes.

Accuracy—The open water rating curve is fairly well defined. The relation of gauge height to discharge is affected during the log-driving season.

Observer—A. Pineault, Smoky Falls.

Discharge Measurements of Sturgeon River at Smoky Falls for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
October 16	Taylor, J. R....	219	3,638	.70	34.44	2,567
November 27	Loy, R.....	223	3,840	.90	35.42	3,442
December 20	Taylor J. R....	219	3,611	.65	34.29	2,348
1919						
February 25	"	220	3,518	.69	34.58	2,438 (a)
March 20	"	220	3,687	.81	34.99	2,999 (a)
April 22	"	240	4,963	2.31	40.00	11,565
September 27	"	220	3,824	1.10	35.81	4,212

(a) Ice measurement.

Monthly Discharge of Sturgeon River at Smoky Falls for year ending September 30th, 1919

Drainage Area, 2,570 Square Miles

Month	Discharge in Second-feet.			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area.
October... (1918)	6,630	2,390	3,467	2.58	.93	1.35	1.56
November "	5,890	3,570	4,290	2.29	1.39	1.67	1.86
December "	3,570	2,100	2,595	1.39	.82	1.01	1.16
January .. (1919)	2,550	1,820	2,177	.99	.71	.85	.98
February	2,450	2,180	2,324	.95	.85	.90	.94
March.....	4,530	1,600	2,718	1.76	.62	1.05	1.21
April.....	11,490	3,410	7,713	4.47	1.33	3.00	3.35
May.....	12,900	8,770	10,548	5.02	3.41	4.10	4.73
June	9,970	2,920	7,050	3.88	1.14	2.74	3.06
July	3,700	2,440	2,801	1.44	.95	1.09	1.26
August	3,100	1,900	2,158	1.21	.74	.84	.97
September	5,360	1,940	3,014	2.10	.75	1.17	1.30
The year	12,900	1,600	4,245	5.02	.62	1.65	22.42

Vermilion River near Whitefish

Location—At the C.P.R. bridge, two miles east of the Whitefish station, Township of Graham, District of Sudbury.

Records Available—Discharge measurements from August, 1913, to October, 1917. Daily gauge heights from June 11, 1915.

Drainage Area—1,580 square miles.

Gauge—Vertical steel staff with enamelled face graduated in feet and inches attached to pile at left abutment of old highway bridge. Zero of the gauge is at an elevation of 25.00 referred to a bench mark elevation 38.39 painted on rock on right bank 15 feet above section.

Channel and Control—Straight for about 300 feet above and 700 feet below the station. Both banks are high, rocky and wooded, and not liable to overflow. Bed of stream is rocky and permanent, current is swift, two channels existing at all stages. At low stages log jams occur at the rapids, causing backwater on the gauge.

Discharge Measurements—Made from the bridge with current meter.

Winter Flow—The relation between the gauge heights and discharge is seriously affected by ice under some conditions.

Observer—A. Boucher, Whitefish.

Daily Gauge Height in feet of Vermilion River near Whitefish for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
1	27.83		31.08		29.92		28.33		27.75		27.33		29.25		31.25		30.92		28.42		27.75		27.50	
2	27.83		30.75		29.67		28.25		27.75		27.25		29.25		31.17		30.75		28.33		27.75		27.42	
3	27.75		30.50		29.58		28.25		27.75		27.25		29.25		30.00		30.50		28.17		27.75		27.42	
4	27.67		30.33		29.42		28.17		27.67		27.33		29.42		30.92		30.42		28.08		27.75		27.33	
5	27.08		30.17		29.25		28.17		27.67		27.33		29.58		30.92		30.25		28.00		27.67		27.33	
6	27.25		30.08		29.33		28.08		27.67		27.33		29.00		30.83		30.17		28.00		27.67		27.33	
7	27.42		29.92		29.25		28.00		27.67		27.33		29.00		30.83		30.08		27.92		27.58		27.33	
8	27.67		29.92		29.17		27.00		27.58		27.42		30.17		30.75		30.17		27.92		27.58		27.33	
9	27.67		29.00		29.17		27.00		27.58		27.33		31.33		30.75		30.17		27.83		27.42		27.42	
10	27.58		29.83		29.17		27.92		27.58		27.33		31.33		30.67		30.17		27.83		27.42		27.42	
11	27.58		29.67		29.17		27.92		27.58		27.42		31.67		30.58		30.08		27.83		27.33		27.42	
12	27.67		29.58		29.17		27.00		27.50		27.42		32.50		30.50		30.08		27.75		27.33		27.42	
13	27.67		29.33		29.08		27.00		27.50		27.50		32.75		30.50		30.08		27.75		27.33		27.50	
14	27.67		29.17		29.17		27.00		27.50		27.50		32.67		30.33		30.08		27.83		27.17		27.50	
15	27.75		28.92		29.17		27.92		27.50		27.50		32.67		30.25		29.92		27.83		27.08		27.50	
16	27.75		28.58		29.17		27.92		27.50		27.58		32.50		30.25		29.83		27.75		27.00		27.50	
17	27.92		28.75		29.17		27.92		27.50		27.50		32.50		30.25		29.83		27.75		26.92		27.58	
18	28.25		29.25		29.17		27.92		27.50		27.75		32.33		30.50		29.83		27.75		26.92		27.58	
19	28.33		30.58		29.08		27.92		27.42		27.83		32.08		30.50		29.42		27.67		27.00		27.67	
20	28.33		31.33		29.08		27.00		27.42		27.00		32.08		30.58		29.33		27.75		27.08		27.67	
21	28.33		31.33		27.42		28.08		27.42		28.08		31.92		30.67		29.25		27.83		27.25		27.75	
22	28.42		31.25		28.92		28.08		27.42		28.25		31.83		30.75		29.17		27.92		27.25		27.75	
23	28.42		31.17		28.92		28.08		27.42		28.25		31.83		31.42		29.00		28.00		27.25		27.75	
24	28.75		30.92		28.83		28.08		27.42		28.58		31.75		31.50		28.92		28.00		27.25		28.17	
25	29.08		30.83		28.67		27.00		27.33		28.75		31.67		31.58		28.83		28.00		27.33		28.25	
26	29.08		30.75		28.33		27.00		27.33		28.75		31.67		31.75		28.83		28.00		27.33		28.33	
27	29.67		30.67		28.58		27.92		27.33		28.92		31.50		31.75		28.75		27.92		27.42		28.42	
28	29.92		30.50		28.50		27.92		27.33		28.00		31.42		31.67		28.67		27.92		27.42		28.50	
29	30.92		30.33		28.50		27.83		27.33		29.08		31.33		31.50		28.67		27.92		27.42		28.67	
30	30.00		30.25		28.42		27.83		27.33		29.17		31.33		31.33		28.58		27.83		27.50		28.67	
31	31.08				28.42		27.75				29.17				31.17				27.83		27.50			

Wanapitei River at McVittie's

Location—On the C. N. Railway, twenty-three miles south of Sudbury, one mile above McVittie's siding (Power Plant No. 2) and three hundred feet above Ragged Rapids. In the Township of Secord, District of Sudbury.

Records Available—Discharge measurements from September, 1916, and daily gauge heights from October 1st, 1916.

Drainage Area—1,175 square miles.

Gauge—Chain gauge, consisting of 0'-12' of standard gauge plating fastened to cedar tree thirty feet above section. Zero (elevation 99.00) is referred to a B.M. (elevation 105.15), which is the head of a spike driven into stump seven feet south of section on left bank.

Channel—Channel curves slightly above section and is straight below. Banks are wooded and liable to overflow during log jams. Bed of stream is shifting.

Discharge Measurements—Made from boat.

Control—During log driving periods, logs jam at head of falls, three hundred feet below sections, causing backwater.

Observer—J. S. McVittie, McVittie's Siding.

Discharge Measurement of Wanapitei River at McVittie's, for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919 Jan. 22.....	Taylor, J. R.	149	2,124	.47	101.01	991 (a)

(a) Ice measurement.

Daily Gauge Height in feet of Wanapitei River at McVittie's for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September		
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	
																									Feet
1	100.29		101.33		102.60		101.10		100.81		100.33		101.08				105.75					100.25		101.04	
2	100.37		101.23		102.54		101.12		100.73		100.73		100.79			106.37						100.75		101.10	
3	100.33		101.08		102.50		101.14		100.79		100.75		100.73				105.33					100.73		100.98	
4	100.44		101.08		102.56		101.12		100.62				100.73									100.65		100.96	
5	100.60		101.29		102.42		101.08		100.87		100.64		101.33				104.71					100.62		100.92	
6	101.19		101.56		102.35		101.14		100.89		100.67		102.75			106.71						100.87		100.79	
7	101.37		101.71		102.33		101.08		100.92		100.60											100.62		100.81	
8	101.27		102.12		102.17		101.14		100.83		100.56		103.00			106.42						100.60		100.81	
9	100.87		102.46		101.98		101.12		100.81		100.52		102.58				104.25					100.58		100.83	
10	100.62		102.83		101.58		101.14		100.83		100.58					106.33						100.56		100.83	
11	100.64		102.67		101.46		101.08		100.81		100.56		103.85			106.23						100.50		100.67	
12	100.85		102.58		101.42		101.06		100.77		100.54		103.85			106.08						100.50		100.79	
13	100.94		102.62		101.40		101.08		100.73		100.48		102.96			106.00						100.44		100.75	
14	101.00		102.56		101.40		101.21		100.73		100.39		102.60			105.87						100.44		100.75	
15	100.92		102.52		101.42		101.27		100.71		100.39		102.29			105.79						100.54		100.85	
16	100.85		102.46		101.46		101.30		100.60		100.73		102.04			105.58						100.73		100.77	
17	100.62		102.44		101.42		101.19		100.50		100.94		102.46			106.62						100.75		100.71	
18	101.00		103.42		101.35		101.09		100.71		101.83		103.00			106.42						100.89		100.87	
19	101.19		103.96		101.33		100.96		100.50		101.48		103.29			106.04						100.92		100.87	
20	101.08		103.57		101.29		101.11		100.48		101.52		103.48			105.87						101.00		100.87	
21	101.15		103.21		101.31		101.15		100.46		101.79		103.52									101.04		101.08	
22	101.17		103.00		101.46		101.01		100.42		101.81		103.50				103.08					100.77		101.12	
23	100.96		102.90		102.12		101.00		100.44		101.79						103.02					100.71		101.00	
24	100.94		102.79		101.79		101.00		100.52		101.75					106.08						100.58		100.96	
25	101.44		102.75		101.67		100.97		100.42		101.92		104.42				102.94					100.69		101.04	
26	101.62		102.73		101.67		100.96		100.37		102.08		104.37			106.00						100.77		100.96	
27	102.54		102.67		101.54		100.94		100.35		102.62		104.42			106.00						100.79		100.75	
28	102.04		102.60		101.35		100.98		100.37		102.08					105.90						100.96		100.73	
29	101.87		102.58		101.23		100.97		100.37		101.71					105.92						100.81		101.96	
30	101.67		102.60		101.17		100.96		100.37		101.48		106.46									100.85			
31	101.37		100.85		101.12		100.85				101.33											100.87			

Regular Stations

NORTH-WESTERN ONTARIO DISTRICT

River	Location	Drain- age Area Sq. Miles	Township	District
Eagle	at Eagle River	970	Aubrey	Kenora
English	at Ear Falls	11,700	.....	" .....
"	at Manitou Falls	14,600	.....	" .....
"	near Oak Falls	15,570	.....	" .....
"	at Pine Ridge, H.B. Co's. Post .....	.....	.....	" .....
Turtle	at Mountain Rapids ...	1,760	.....	Rainy River
Wabigoon	near Quibell	2,400	Wabigoon	Kenora

Eagle River at Eagle River

Location—Fifty feet south of the C.P.R. bridge, 300 ft. west of Eagle River Station, near Lot 24, Con. 6, Township of Aubrey, District of Kenora.

Records Available—Discharge measurements and gauge heights from November, 1918. Also, discharge measurements from January, 1914, to November, 1918, and gauge heights from February, 1914, to November, 1918, at the highway bridge, about 1,000 feet upstream from present section.

Drainage Area—970 square miles.

Gauge—Chain gauge, consisting of 0'6' of standard gauge plating, on right bank above C.P.R. bridge. Zero, elev. 1,154.41, referred to B.M., elev. 1,163.16, painted with white paint on rock 6 ft. south of line of section.

Channel and Control—Channel is narrow both above and below section, widening out above section. The banks are rocky and wooded, and will not overflow. There is one channel at all stages. There is considerable regulation of the flow at the pulp mill above.

Discharge Measurements—Made from canoe.

Winter Flow—There is no ice effect.

Observer—J. Nelson, Eagle River.

Discharge Measurements of Eagle River (Bridge Section) at Eagle River for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 13.....	Taylor, J. R....	34	112	2.20	1173.87	247
" 15.....	"	34	112	2.21	1173.86	248
" 16.....	"	34	112	2.18	1173.87	243
" 17.....	"	34	115	2.21	1173.94	254

Discharge Measurements of Eagle River (Boat Section) at Eagle River for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 16.....	Taylor, J. R....	44	199	1.22	1156.26	244
" 16.....	"	44	199	1.22	1156.27	243
" 17.....	"	44	204	1.25	1156.35	254
" 17.....	"	44	204	1.24	1156.35	253

**Daily Gauge Height in feet of Eagle River at Eagle River for year ending
September 30th, 1919**

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-	Gauge	Dis-
	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge	Ht.	charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1173.68	...	1173.66	...	1156.46	...	1156.41	...	1156.35	...	1156.24	...	1156.25	...	1157.22	...	1157.39	...	1158.43	...	1160.82	...	1159.78	...
2	1173.66	...	1173.66	...	1156.44	...	1156.37	...	1156.29	...	1156.25	...	1156.27	...	1157.17	...	1157.34	...	1158.89	...	1160.82	...	1159.73	...
3	1173.66	...	1173.63	...	1156.44	...	1156.37	...	1156.29	...	1156.23	...	1156.28	...	1157.11	...	1157.30	...	1158.89	...	1160.75	...	1159.69	...
4	1173.63	...	1173.61	...	1156.45	...	1156.35	...	1156.21	...	1156.21	...	1156.27	...	1156.99	...	1157.37	...	1160.33	...	1160.72	...	1159.66	...
5	1173.66	...	1173.59	...	1156.43	...	1156.32	...	1156.25	...	1156.23	...	1156.28	...	1157.04	...	1157.50	...	1160.64	...	1160.65	...	1159.58	...
6	1173.68	...	1173.61	...	1156.41	...	1156.32	...	1156.29	...	1156.24	...	1156.26	...	1157.15	...	1157.68	...	1160.91	...	1160.60	...	1159.53	...
7	1173.70	...	1173.63	...	1156.41	...	1156.28	...	1156.28	...	1156.27	...	1156.28	...	1157.16	...	1157.70	...	1161.01	...	1160.58	...	1159.56	...
8	1173.70	...	1173.70	...	1156.46	...	1156.33	...	1156.24	...	1156.23	...	1156.37	...	1157.16	...	1157.74	...	1161.08	...	1160.50	...	1159.47	...
9	1173.66	...	1173.70	...	1156.49	...	1156.33	...	1156.29	...	1156.27	...	1156.39	...	1157.16	...	1157.71	...	1161.16	...	1159.92	...	1159.52	...
10	1173.63	...	1173.74	...	1156.47	...	1156.30	...	1156.31	...	1156.25	...	1156.45	...	1157.19	...	1157.83	...	1161.16	...	1160.32	...	1159.58	...
11	1173.61	...	1173.78	...	1156.49	...	1156.25	...	1156.30	...	1156.24	...	1156.43	...	1157.20	...	1157.84	...	1161.15	...	1160.20	...	1159.52	...
12	1173.63	...	1173.82	...	1156.47	...	1156.23	...	1156.29	...	1156.23	...	1156.49	...	1157.23	...	1157.91	...	1161.16	...	1160.20	...	1159.58	...
13	1173.63	...	1173.82	...	1156.45	...	1156.23	...	1156.25	...	1156.21	...	1156.48	...	1157.31	...	1157.92	...	1161.18	...	1160.18	...	1159.62	...
14	1173.61	...	1173.84	...	1156.45	...	1156.24	...	1156.23	...	1156.23	...	1156.47	...	1157.27	...	1157.93	...	1161.18	...	1160.16	...	1159.67	...
15	1173.61	...	1173.84	...	1146.42	...	1156.23	...	1156.20	...	1156.23	...	1156.51	...	1157.24	...	1157.88	...	1161.16	...	1160.34	...	1159.61	...
16	1173.59	...	1173.86	...	1156.43	...	1156.20	...	1156.23	...	1156.23	...	1156.53	...	1157.23	...	1157.85	...	1161.11	...	1160.33	...	1159.58	...
17	1173.59	...	1173.91	...	1156.48	...	1156.24	...	1156.24	...	1156.24	...	1156.51	...	1157.26	...	1157.86	...	1161.14	...	1160.28	...	1159.53	...
18	1173.66	...	1173.91	...	1156.47	...	1156.24	...	1156.18	...	1156.23	...	1156.53	...	1157.19	...	1157.91	...	1161.16	...	1160.24	...	1159.53	...
19	1173.68	...	1173.95	...	1156.48	...	1156.29	...	1156.22	...	1156.21	...	1156.55	...	1157.20	...	1157.88	...	1161.12	...	1160.25	...	1159.54	...
20	1173.68	...	1156.39	...	1156.49	...	1156.30	...	1156.26	...	1156.21	...	1156.59	...	1157.17	...	1157.84	...	1161.16	...	1160.25	...	1159.63	...
21	1173.63	...	1156.34	...	1156.49	...	1156.33	...	1156.28	...	1156.21	...	1156.65	...	1157.18	...	1157.84	...	1161.16	...	1160.24	...	1159.66	...
22	1173.63	...	1156.42	...	1156.43	...	1153.33	...	1156.23	...	1156.18	...	1156.78	...	1157.15	...	1157.86	...	1161.13	...	1160.22	...	1159.60	...
23	1173.61	...	1156.46	...	1156.40	...	1156.33	...	1156.30	...	1156.22	...	1156.73	...	1157.12	...	1158.17	...	1161.09	...	1160.19	...	1159.66	...
24	1173.59	...	1156.48	...	1156.39	...	1156.31	...	1156.29	...	1156.24	...	1156.84	...	1157.16	...	1158.24	...	1161.04	...	1160.09	...	1159.70	...
25	1173.51	...	1156.45	...	1156.45	...	1156.30	...	1156.24	...	1156.23	...	1156.96	...	1157.15	...	1158.16	...	1161.02	...	1159.99	...	1159.74	...
26	1173.61	...	1156.45	...	1156.41	...	1156.30	...	1156.23	...	1156.25	...	1157.03	...	1157.15	...	1158.16	...	1160.99	...	1159.95	...	1159.79	...
27	1173.59	...	1156.44	...	1156.40	...	1156.39	...	1156.22	...	1156.25	...	1157.08	...	1157.16	...	1158.16	...	1160.99	...	1159.90	...	1159.77	...
28	1173.66	...	1156.46	...	1156.39	...	1156.40	...	1156.21	...	1156.26	...	1157.12	...	1157.13	...	1158.17	...	1160.94	...	1159.85	...	1159.65	...
29	1173.66	...	1156.48	...	1156.43	...	1156.37	...	1156.21	...	1156.25	...	1157.23	...	1157.11	...	1158.16	...	1160.91	...	1159.84	...	1159.66	...
30	1173.63	...	1156.49	...	1156.46	...	1156.37	...	1156.21	...	1156.24	...	1157.24	...	1157.11	...	1158.11	...	1160.89	...	1159.82	...	1159.66	...
31	1173.61	...	...	...	1156.48	...	1156.38	...	...	...	1156.26	...	...	...	1157.24	...	...	...	1160.85	...	1159.79	...	...	...

NOTE.—November 20th, change in location of gauge.

English River at Ear Falls

Location—At the foot of Lac Seul, about three miles below Pine Ridge Hudson's Bay Co's. Post, and about $\frac{1}{4}$ mile above upper Ear Falls, District of Kenora.

Records Available—Discharge measurements from July, 1914. Weekly gauge heights are secured here and daily gauge heights at a gauge at Pine Ridge Post.

Drainage Area—11,700 square miles.

Gauge—Vertical staff with enamelled face screwed to a 6-inch hewn spruce post which is firmly wedged in the rock of the left bank 200 feet below a 2-inch poplar, which is painted white and used as the initial point for soundings. The zero of the gauge (elev. 115.12) is referred to a bench mark (elev. 122.75) painted on a point of rock 5 feet above the gauge.

Channel and Control—Straight for about 300 feet above and below the station, then turning to the left widens out to the top of the falls. Both banks are high, rocky and wooded, and will not overflow. The bed of the stream at the section is apparently permanent; the current sluggish, and flowing through one channel at all stages. The natural control is wide, shallow and unobstructed.

Discharge Measurements—Made from a canoe with a small Price current meter.

Winter Flow—Ice conditions have only slight effect.

Accuracy—Back flow at the left bank causes a little difficulty in making accurate discharge measurements.

Observer—Robert Young, care of Hudson Bay Co's. Lac Seul Post, Sioux Lookout P.O.

Remarks—The very steady regimen of the English River, together with the lack of gauge readers, makes it possible and necessary to apply the gauge heights at Ear Falls to gauges at Manitou and Oak Falls. Gauge readings taken on nearly the same day were used in making up curves for the three stations, and the results obtained justify the assumptions made. No allowance is made for lag. With additional data it may be possible to extend the system to points farther down the river.

Day

[illegible]

Monthly Discharge of English River at Ear Falls for year ending Sept. 30th, 1919

Drainage Area, 11,700 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	6,400	3,960	5,798	.55	.34	.50	.58
November "	7,350	5,520	6,342	.63	.47	.54	.60
December "	7,810	7,460	7,692	.67	.64	.66	.76
January (1919)	7,580	6,950	7,332	.65	.59	.63	.73
February	6,700	6,190	6,450	.57	.53	.55	.57
March	5,570	3,960	5,028	.48	.34	.43	.50
April	5,210	4,980	5,108	.45	.43	.44	.49
May	5,720	5,450	5,600	.49	.47	.48	.55
June	7,260	5,990	6,732	.62	.51	.58	.65
July	7,580	7,090	7,324	.65	.61	.63	.73
August	7,200	6,870	7,008	.62	.59	.60	.69
September	7,460	6,870	7,192	.64	.59	.61	.68
The year	7,810	3,960	6,469	.67	.34	.55	7.51

English River at Manitou Falls

Location—About 800 feet above the first chute of the Manitou Falls, and five miles below the mouth of the Mattawa River. The Cedar River enters the English River $\frac{1}{2}$ mile below the metering section.

Records Available—Discharge measurements from July, 1914.

Drainage Area—14,600 square miles.

Gauge—Vertical staff with enamelled face screwed to a 6-inch pine post and firmly wedged and wired to the right bank 15 feet south of a 2-inch jack pine, which is used as the initial point for soundings. The zero of the gauge (elev. 89.37) is referred to a bench mark (elev. 100.43) painted on a point of rock 2.5 feet south-east of the initial point.

Channel and Control—About 1,200 feet above the station the channel begins to narrow down and turns to the right out of the lake above. It is comparatively straight thence to the station and falls. Both banks are high, rocky and wooded, and will not overflow. The bed of the stream is rocky and permanent. The current is slow above and moderately swift at the section.

Discharge Measurements—Made from a canoe with a small Price current meter.

Remarks—The very steady regimen of the English River, together with the lack of gauge readers, makes it possible and necessary to apply the gauge heights at Ear Falls to the gauge at Manitou Falls. Gauge readings taken on nearly the same day were used in making up curves for the two stations, and the results obtained justify the assumptions made. No allowance is made for "lag."

Monthly Discharge of English River at Manitou Falls for year ending
September 30th, 1919

Drainage Area, 14,600 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	7,760	4,700	7,018	.53	.32	.48	.55
November "	8,820	6,740	7,680	.60	.46	.53	.59
December "	9,320	8,950	9,198	.64	.61	.63	.73
January (1919)	9,070	8,370	8,798	.62	.57	.60	.69
February	8,100	7,520	7,815	.55	.52	.54	.56
March	6,800	4,700	6,110	.47	.32	.42	.48
April	6,370	6,080	6,242	.44	.42	.43	.48
May	6,970	6,660	6,838	.48	.46	.47	.54
June	8,730	7,290	8,132	.60	.50	.56	.62
July	9,070	8,530	8,794	.62	.58	.60	.69
August	8,660	8,280	8,440	.59	.57	.58	.67
September	8,950	8,280	8,645	.61	.57	.59	.66
The year	9,320	4,700	7,811	.64	.32	.54	7.26

English River near Oak Falls

Location—About one mile above the upper Oak Fall, just above Little Rapids, and about one-half mile below Wilcox Lake, District of Kenora.

Records Available—Discharge measurements from August, 1914.

Drainage Area—15,570 square miles.

Gauge—Vertical staff with enamelled face screwed to a cedar post and firmly wedged in rock on the right bank 200 feet above the metering section. The zero of the gauge (elev. 194.12) is referred to a bench mark (elev. 200.00) painted on a rock in the river near the right bank and 20 feet above the final point for soundings. The initial point for soundings is located on the left bank, and consists of the head of a nail driven in the side of a 12-inch poplar blazed and marked I.P., N. 70° W.

Channel and Control—Straight for about 300 feet above and $\frac{1}{2}$ mile below the station. Both banks are high, rocky and wooded, and not liable to overflow. The bed of the stream is rocky and practically permanent. The current is sluggish above and moderately swift below the station, a small rapid existing about 800 feet below.

Discharge Measurements—Made from a canoe with a small Price current meter.

Remarks—The very steady regimen of the English River, together with the lack of gauge readers, makes it possible and necessary to apply the gauge heights at Ear Falls to the gauge at Oak Falls. Gauge readings taken on nearly the same day were used in making up curves for the two stations, and the results obtained justify the assumptions made. No allowance is made for "lag."

Daily Gauge Height in feet and Discharge in second-feet of English River near Oak Falls for year ending September 30th 1919

[illegible]

**Monthly Discharge of English River near Oak Falls for year ending
September 30th, 1919**

Drainage Area, 15,570 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October... (1918)	8,100	5,270	7,392	.52	.34	.47	.54
November "	9,360	7,020	8,055	.60	.45	.52	.58
December "	9,990	9,510	9,832	.64	.61	.63	.73
January...(1919)	9,690	8,790	9,342	.62	.56	.60	.69
February.. "	8,450	7,840	8,155	.54	.50	.52	.54
March..... "	7,080	5,270	6,472	.45	.34	.42	.48
April..... "	6,680	6,420	6,564	.43	.41	.42	.47
May..... "	7,240	6,960	7,115	.47	.45	.46	.53
June..... "	9,240	7,620	8,532	.59	.49	.55	.61
July..... "	9,690	9,000	9,336	.62	.58	.60	.69
August.... "	9,180	8,670	8,872	.59	.56	.57	.66
September. "	9,510	8,670	9,135	.61	.56	.59	.66
The year.....	9,990	5,270	8,236	.64	.34	.53	7.18

English River at Pine Ridge H. B. Co.'s Post

Gauge—This gauge is located on the wharf of the Hudson Bay Company's Post at Pine Ridge and is read by the same man, by whom the Ear Falls gauge is read. This gauge is read daily with the object of securing data to show probable fluctuations at the Ear Falls gauge.

Daily Gauge Height in feet and Discharge in second-feet of English River at Pine Ridge H. B. Co.'s Post for year ending
September 30th, 1919

Date	October			November			December			January			February			March			April			May			June			July			August			September		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
	Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.	Feet
1	93.47	6990	93.15	6310	93.75	7580	93.89	7880	93.60	7270	93.19	6400	92.82	5600	92.79	5540	93.07	6140	93.87	7840	93.73	7540	93.81	7710	93.07	6140	93.87	7840	93.73	7540	93.81	7710				
2	93.33	6690	93.15	6310	93.75	7580	93.88	7860	93.58	7230	93.19	6400	91.95	3900	92.81	5580	93.07	6140	93.90	7900	93.74	7560	93.53	7120	93.07	6140	93.90	7900	93.74	7560	93.53	7120				
3	93.37	6780	93.14	6290	93.78	7650	93.89	7880	93.53	7120	93.16	6330	91.94	3880	92.83	5630	93.10	6200	93.76	7600	93.72	7510	93.56	7190	93.10	6200	93.76	7600	93.72	7510	93.56	7190				
4	93.45	6950	93.19	6400	93.77	7620	93.89	7880	93.50	7060	93.14	6290	91.91	3830	92.76	5480	93.29	6610	93.85	7800	93.74	7560	93.61	7290	93.29	6610	93.85	7800	93.74	7560	93.61	7290				
5	93.49	7040	93.25	6520	93.81	7710	93.89	7880	93.51	7080	93.14	6290	91.93	3860	92.85	5670	93.36	6760	93.91	7920	93.62	7310	93.64	7350	93.36	6760	93.91	7920	93.62	7310	93.64	7350				
6	93.47	6990	93.10	5990	93.86	7820	93.91	7920	93.51	7080	93.11	6290	92.32	4590	92.88	5740	93.43	6910	94.02	8160	93.94	7620	93.67	7400	93.43	6910	94.02	8160	93.94	7620	93.67	7400				
7	93.56	7190	93.13	6270	93.84	7770	93.94	7980	93.50	7060	93.11	6220	92.74	5430	92.87	5710	93.39	6820	93.91	7920	93.65	7380	93.77	7620	93.39	6820	93.91	7920	93.65	7380	93.77	7620				
8	93.26	6550	93.23	6480	93.85	7800	93.90	7900	93.50	7060	93.11	6220	92.74	5430	92.93	5840	93.39	6820	93.91	7920	93.65	7380	93.77	7620	93.39	6820	93.91	7920	93.65	7380	93.77	7620				
9	93.26	6550	92.92	5820	93.86	7820	93.94	7980	93.48	7020	93.07	6140	92.72	5390	92.94	5860	93.37	6780	93.58	7230	93.59	7250	93.69	7400	93.37	6780	93.58	7230	93.59	7250	93.69	7400				
10	93.26	6550	93.26	6550	93.86	7820	93.91	7710	93.50	7060	93.06	6120	92.71	5370	92.97	5930	93.53	7120	93.80	7880	93.63	7330	93.66	7460	93.53	7120	93.80	7880	93.63	7330	93.66	7460				
11	93.41	6860	93.39	6820	93.89	7880	93.82	7730	93.44	6930	93.05	6100	92.68	5310	92.98	5950	93.58	7230	93.89	7880	93.70	7470	93.67	7420	93.58	7230	93.89	7880	93.70	7470	93.67	7420				
12	93.16	6330	93.10	6200	93.89	7880	93.82	7730	93.43	6910	93.01	6010	92.72	5390	92.97	5930	93.59	7250	93.85	7800	93.65	7380	93.83	7750	93.59	7250	93.85	7800	93.65	7380	93.83	7750				
13	93.12	6240	93.23	6480	93.90	7900	93.82	7730	93.44	6930	93.02	6030	92.69	5330	93.02	6030	93.50	7060	93.96	8030	93.71	7490	93.87	7840	93.50	7060	93.96	8030	93.71	7490	93.87	7840				
14	93.31	6650	93.42	6880	93.90	7900	93.81	7710	93.39	6820	93.04	6070	92.68	5310	93.01	6010	93.55	7160	93.74	7560	93.76	7600	93.85	7800	93.55	7160	93.74	7560	93.76	7600	93.85	7800				
15	93.23	6480	93.39	6820	93.89	7880	93.83	7750	93.39	6820	93.06	6120	92.65	5240	93.01	6010	93.57	7210	93.79	7670	93.78	7650	93.87	7880	93.57	7210	93.79	7670	93.78	7650	93.87	7880				
16	93.29	6610	93.39	6820	93.94	7980	93.79	7670	93.37	6780	92.97	5930	92.64	5220	93.03	6050	93.59	7250	93.85	7800	93.77	7620	93.81	7710	93.59	7250	93.85	7800	93.77	7620	93.81	7710				
17	93.23	6480	93.42	6880	93.94	7980	93.81	7710	93.34	6710	92.94	5860	92.64	5220	93.03	6050	93.69	7450	93.89	7880	93.74	7560	93.81	7710	93.69	7450	93.89	7880	93.74	7560	93.81	7710				
18	93.35	6730	93.29	6610	93.90	7900	93.77	7620	93.35	6740	92.96	5910	92.67	5290	93.01	6010	93.65	7380	93.87	7840	93.80	7690	93.89	7880	93.65	7380	93.87	7840	93.80	7690	93.89	7880				
19	93.20	6420	93.45	6950	93.94	7980	93.82	7730	93.36	6760	92.94	5860	92.64	5220	93.00	5990	93.64	7350	93.88	7860	93.74	7560	93.81	7710	93.64	7350	93.88	7860	93.74	7560	93.81	7710				
20	92.96	5910	93.45	6950	93.94	7980	93.78	7650	93.32	6670	92.87	5710	93.64	5220	93.02	6030	93.70	7670	93.88	7860	93.74	7560	93.81	7710	93.70	7670	93.88	7860	93.74	7560	93.81	7710				
21	93.32	6670	93.45	6950	93.91	7920	93.74	7560	93.31	6650	92.42	4780	92.69	5330	93.02	6030	93.79	7670	93.87	7820	93.74	7560	93.81	7710	93.79	7670	93.87	7820	93.74	7560	93.81	7710				
22	93.01	6010	93.53	7120	93.89	7880	93.72	7510	93.27	6570	92.90	5780	92.66	5270	93.09	6180	93.85	7800	93.60	7270	93.60	7270	93.60	7270	93.60	7270	93.60	7270	93.60	7270	93.60	7270				
23	93.17	6350	93.42	6880	93.93	7960	93.72	7510	93.27	6550	92.91	5800	92.64	5220	93.08	6160	93.85	7800	93.72	7510	93.81	7710	93.60	7270	93.81	7710	93.60	7270	93.81	7710	93.60	7270				
24	93.18	6380	93.45	6950	93.93	7960	93.73	7540	93.26	6550	92.91	5800	92.64	5220	93.08	6160	93.85	7800	93.72	7510	93.72	7510	93.72	7510	93.72	7510	93.72	7510	93.72	7510	93.72	7510				
25	93.15	6310	93.60	7270	93.95	8000	93.70	7470	93.23	6480	92.39	4720	92.71	5370	93.06	6120	93.74	7560	93.85	7800	93.85	7800	93.85	7800	93.85	7800	93.85	7800	93.85	7800	93.85	7800				
26	93.19	6400	93.60	7270	93.93	7960	93.64	7350	93.22	6460	92.81	5580	92.76	5480	93.10	6200	93.65	7380	93.81	7710	93.53	7120	93.53	7120	93.53	7120	93.53	7120	93.53	7120	93.53	7120				
27	93.18	6380	93.70	7470	93.93	7960	93.68	7440	93.20	6420	92.84	5650	92.71	5370	93.08	6160	93.82	7730	93.47	6990	93.62	7310	93.72	7510	93.47	6990	93.62	7310	93.72	7510	93.47	6990				
28	93.10	6200	93.68	7440	93.95	8000	93.64	7350	93.20	6420	92.86	5690	92.77	5500	93.03	6050	93.79	7670	93.69	7450	93.67	7420	93.89	7880	93.79	7670	93.69	7450	93.67	7420	93.89	7880				
29	93.14	6290	93.65	7380	93.90	7900	93.66	7400	93.20	6420	92.86	5690	92.77	5540	93.06	6120	93.72	7510	93.82	7730	93.72	7510	93.89	7880	93.72	7510	93.82	7730	93.72	7510	93.89	7880				
30	93.12	6240	93.63	7460	93.91	7920	93.65	7380	93.20	6420	92.89	5720	92.85	5670	93.13	6270	93.72	7510	93.81	7740	93.81	7740	93.89	7880	93.72	7510	93.81	7740	93.81	7740	93.89	7880				
31	93.07	6140	93.63	7460	93.91	7920	93.67	7420	93.20	6420	92.89	5720	92.85	5670	93.13	6270	93.72	7510	93.81	7740	93.81	7740	93.89	7880	93.72	7510	93.81	7740	93.81	7740	93.89	7880				

Monthly Discharge of English River at Pine Ridge H.B. Co.'s Post for
year ending September 30th, 1919

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	7,190	5,910	6,528	.61	.51	.56	.65
November "	7,470	5,820	6,751	.64	.50	.58	.65
December "	8,000	7,580	7,865	.68	.65	.67	.77
January (1919)	7,980	7,350	7,672	.68	.63	.66	.76
February	7,270	6,420	6,832	.62	.55	.58	.60
March	6,400	4,720	5,872	.55	.40	.50	.58
April	5,670	3,830	5,133	.48	.33	.44	.49
May	6,460	5,480	5,963	.55	.47	.51	.59
June	7,840	6,140	7,176	.67	.52	.61	.68
July	8,400	6,990	7,739	.72	.60	.66	.76
August	7,880	7,120	7,468	.67	.61	.64	.74
September	8,210	7,120	7,629	.70	.61	.65	.72
The year	8.400	3,830	6,889	.72	.33	.59	8.00

Turtle River at Mountain Rapids

Location—About 300 feet above Mountain Rapids, and about 8 miles from the Olive Mine, 12 miles from Mine Centre, which is on the C. N. Ry., in the Rainy River District.

Records Available—Monthly discharge measurements from August, 1914. Daily gauge heights from August 9, 1914.

Drainage Area—1,760 square miles.

Gauge—Vertical steel staff gauge with enamelled face, graduated in feet and inches, and fastened on a crib pier at the C. N. Ry. saw mill, 12 miles from the station. The gauge is located 1,000 feet south of the mouth of Little Turtle River, on the east shore of Little Turtle Lake. Zero of gauge (elevation 82.99) is referred to a bench mark (assumed elevation 100.00) established on a rock with white paint, 35 feet north-east of the gauge, at the C. N. Ry. mill at Mine Centre.

Channel and Control—Straight for about 1,000 feet above and below the station, the water running slowly. The banks are high, wooded and rocky. The bed of the stream is sandy and clean, one channel existing at all stages. The river is used extensively for log driving, and the log jams in Otter Falls affect the section somewhat.

Discharge Measurements—Made from a canoe with a small Price current meter.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice and measurements are made during the winter to determine the flow.

Accuracy—Open water rating curve fairly well defined between gauge heights 91.50 and 94.50. The relation of gauge height to discharge during the log-driving period is affected by back water from log jams.

Observer—Hiram Smith, Mine Centre.

Daily Gauge Height in feet and Discharge in second-feet of Turtle River at Mountain Rapids for year ending September 30th, 1919

Day	October			November			December			January			February			March			April			May			June			July			August			September		
	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet						
1	91.69	845	92.50	93.13	.....	92.22	.....	91.66	.....	91.49	.....	91.66	830	94.89	2960	92.82	1410	91.78	885	94.54	2640	92.68	1350									
2	91.67	835	92.54	93.07	.....	92.20	.....	91.63	.....	91.49	.....	91.68	840	94.91	2980	92.79	1390	91.97	970	94.44	2550	92.60	1280									
3	91.63	820	92.55	93.03	.....	92.18	.....	91.63	.....	91.49	.....	91.72	860	94.87	2950	92.68	1330	92.78	1380	94.35	2480	92.56	1260									
4	91.61	810	92.58	92.99	.....	92.13	.....	91.63	.....	91.49	.....	91.82	905	94.82	2900	92.62	1300	94.13	2290	94.20	2350	92.51	1240									
5	91.67	835	92.59	92.97	.....	92.11	.....	91.63	.....	91.49	.....	91.95	960	94.76	2840	92.58	1270	95.95	4210	94.08	2250	92.45	1200									
6	91.73	865	92.61	92.95	.....	92.07	.....	91.63	.....	91.47	.....	92.11	1040	94.62	2710	92.56	1260	96.11	4420	94.04	2220	92.38	1170									
7	91.74	870	92.70	92.91	.....	92.03	.....	91.61	.....	91.47	.....	92.22	1090	94.62	2710	92.52	1240	96.30	4700	94.00	2190	92.36	1160									
8	91.79	890	92.77	92.88	.....	91.99	.....	91.61	.....	91.47	.....	92.41	1180	94.63	2720	92.49	1220	96.45	5080	93.93	2140	92.32	1140									
9	91.81	900	92.81	92.84	.....	91.99	.....	91.61	.....	91.47	.....	92.57	1270	94.62	2710	92.45	1200	96.55	5080	93.80	2040	92.29	1120									
10	91.82	905	93.13	92.80	.....	91.97	.....	91.59	.....	91.47	.....	92.66	1320	94.62	2710	92.42	1190	96.45	4920	93.70	1970	92.29	1120									
11	91.85	915	93.28	91.78	.....	91.95	.....	91.59	.....	91.45	.....	92.72	1350	94.58	2680	92.35	1160	96.30	4700	93.62	1910	92.27	1120									
12	91.89	935	93.38	92.76	.....	91.93	.....	91.59	.....	91.45	.....	92.70	1340	94.59	2690	92.31	1140	96.20	4550	93.67	1950	92.26	1110									
13	91.89	935	93.42	92.74	.....	91.91	.....	91.57	.....	91.45	.....	92.57	1270	94.58	2680	92.27	1120	96.16	4490	93.78	2030	92.24	1100									
14	91.84	915	93.43	92.70	.....	91.91	.....	91.57	.....	91.43	.....	92.67	1320	94.53	2650	92.23	1100	96.14	4470	93.74	2000	92.27	1120									
15	91.82	905	93.43	92.68	.....	91.88	.....	91.57	.....	91.43	.....	92.66	1320	94.46	2570	92.17	1060	96.08	4380	93.68	1960	92.30	1130									
16	91.85	915	93.43	92.63	.....	91.86	.....	91.55	.....	91.43	.....	92.82	1410	94.41	2530	92.08	1020	96.04	4330	93.66	1940	92.29	1120									
17	91.93	955	93.38	92.61	.....	91.84	.....	91.55	.....	91.43	.....	93.32	1710	94.37	2490	92.02	995	95.95	4210	93.65	1940	92.26	1110									
18	91.97	970	93.54	92.57	.....	91.84	.....	91.53	.....	91.43	.....	93.91	2120	94.35	2480	91.99	980	95.84	4060	93.62	1910	92.26	1110									
19	91.96	965	93.57	92.55	.....	91.82	.....	91.53	.....	91.41	.....	94.16	2320	94.23	2380	91.96	965	95.76	3950	93.57	1880	92.28	1120									
20	91.94	960	93.59	92.51	.....	91.82	.....	91.53	.....	91.41	.....	94.32	2450	94.11	2280	91.92	950	95.63	3790	93.54	1860	92.31	1140									
21	91.93	955	93.61	92.49	.....	91.80	.....	91.51	.....	91.41	.....	94.49	2600	94.02	2210	91.89	935	95.52	3650	93.51	1840	92.39	1180									
22	91.92	950	93.61	92.49	.....	91.78	.....	91.51	.....	91.41	.....	94.66	2750	93.94	2140	91.80	895	95.43	3540	93.47	1810	92.46	1210									
23	91.92	950	93.58	92.45	.....	91.76	.....	91.51	.....	91.43	.....	94.82	2900	93.86	2080	91.83	910	95.35	3450	93.42	1780	92.50	1230									
24	91.97	970	93.51	92.43	.....	91.74	.....	91.51	.....	91.43	.....	94.87	3040	93.72	1980	91.85	920	95.25	3340	93.34	1730	92.51	1240									
25	91.99	980	93.47	92.41	.....	91.72	.....	91.51	.....	91.43	.....	95.07	3140	93.60	1940	91.83	910	95.12	3200	93.23	1650	92.54	1250									
26	92.05	1010	93.43	92.36	.....	91.70	.....	91.51	.....	91.49	.....	95.07	3140	93.52	1840	91.83	910	95.03	3100	93.14	1600	92.67	1320									
27	92.07	1020	93.29	92.34	.....	91.70	.....	91.51	.....	91.53	.....	95.04	3120	93.36	1740	91.79	890	94.99	3060	93.02	1530	92.73	1360									
28	92.12	1040	93.21	92.32	.....	91.68	.....	91.49	.....	91.59	.....	94.46	3040	93.23	1650	91.74	870	94.95	3020	92.93	1470	92.75	1370									
29	92.21	1080	93.18	92.28	.....	91.68	.....	.....	.....	91.61	.....	94.89	2960	93.11	1580	91.69	845	94.80	2880	92.84	1420	92.82	1410								
30	92.30	1130	93.16	92.26	.....	91.66	.....	91.61	.....	91.61	.....	94.91	2980	93.01	1520	91.71	855	94.73	2810	92.82	1410	92.82	1410									
31	92.40	1180	.....	92.24	.....	91.66	.....	91.64	.....	91.64	.....	.....	.....	92.87	1440	.....	.....	94.64	2730	92.76	1370	.....	.....											

Monthly Discharge of Turtle River at Mountain Rapids for year ending September 30th, 1919

Drainage Area, 1,760 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	1,180	810	942	.67	.46	.54	.62
November ..	.....	.....	.....	.....	.....	.....	.....
December ..	.....	.....	.....	.....	.....	.....	.....
January (1919)	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....
April	3,140	830	1,884	1.78	.47	1.07	1.19
May	2,980	1,440	2,477	1.69	.82	1.35	1.56
June	1,410	845	1,075	.80	.48	.61	.68
July	5,080	885	3,596	2.89	.50	2.04	2.35
August	2,640	1,370	1,930	1.50	.78	1.10	1.27
September	1,410	1,100	1,206	.80	.62	.69	.77
The period	5,080	810	1,865	2.89	.46	1.06	8.40

Wabigoon River near Quibell

Location—About 200 feet above the second fall from the G.T.P. Railway bridge, and $\frac{1}{2}$ mile below the bridge which spans the first fall. One mile east from Quibell Station, Township of Wabigoon, District of Kenora.

Records Available—Discharge measurements from June, 1914.

Drainage Area—2,400 square miles.

Gauge—Vertical staff with enamelled face screwed to a 5-inch hewn spruce post firmly wedged and braced to the rock on the right bank of the river 1,200 feet above the metering section. The zero of the gauge (elev. 1,061.64) is referred to a bench mark (elev. 1,069.46, G.T.P. datum) painted on a point of rock just below the gauge. The initial point for soundings is a spike driven in the rock on the left bank. The gauge is read once a day during open season and once every other day during winter months.

Channel and Control—1,200 feet above the station the channel takes a sharp bend to the right, thence running comparatively straight to the station and falls. The water is sluggish above and moderately swift at the station. The banks are high, rocky and wooded. The bed of the stream is full of boulders and crevices. One channel exists at all stages.

Discharge Measurements—Made from canoe and ice with a small Price current meter.

Regulation—The Dryden Pulp and Power Company operate a plant on the Wabigoon River at Dryden, which runs 24 hours per day with the exception of Sundays and holidays.

Winter Flow—Ice formation is very heavy here, and the winter flow is somewhat disturbed by it.

Accuracy—Rating curve fairly well defined, and estimates for open water flow only have been made.

Observer—D. C. Warner, Quibell.

Monthly Discharge of Wabigoon River near Quibell for year ending
September 30th, 1919

Drainage Area, 2,400 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	605	570	594	.25	.24	.25	.29
November "	.....	.....	.....	.....	.....	.....	.....
December "	.....	.....	.....	.....	.....	.....	.....
January .. (1919)	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....
March .....	.....	.....	.....	.....	.....	.....	.....
April .....	.....	.....	.....	.....	.....	.....	.....
May.....	2,540	1,930	2,258	1.06	.80	.94	1.08
June	2,600	1,390	1,992	1.08	.58	.83	.93
July	4,560	1,380	3,782	1.90	.58	1.58	1.82
August	3,190	2,290	2,689	1.33	.95	1.12	1.29
September	2,250	1,740	1,906	.94	.72	.79	.88
The period	4,560	570	2,206	1.90	.24	.92	6.29

Regular Stations
SOUTH-WESTERN ONTARIO DISTRICT

River	Location	Drain- age Area Sq. Miles	Township	County
Beaver	near Eugenia Power House .....	.....	Artemesia	Grey.
"	near Kimberley	100	Euphrasia	"
Credit	at Cataract Jet	85	Caledon	Peel.
Rocky Saugeen	near Markdale	96	Glenelg	Grey.
Saugeen	near Port Elgin	1,565	Saugeen	Bruce.
"	near Walkerton	850	Brant	"
Sydenham	near Owen Sound	71	Derby	Grey.
Thames, Main stream	at Kilworth	1,270	Delaware	Middlesex.
" North	near Fanshawe	585	London	"
" South	near Ealing	515	London and West- minster	"

Beaver River near Eugenia Power House

Location—About 400 feet from the power house and above the tail race outlet, at the bridge known as Hislop's Bridge.

Records Available—Discharge measurements from August, 1918, and gauge readings from September 1st, 1918.

Gauge—3 ft. of standard gauge plates on downstream side of bridge, zero of gauge=1.00.

Channel and Control—The channel is straight for about 250 ft. above and below the section. The banks are low but not liable to overflow. The bed of the stream is clean and rocky, one channel existing at all stages.

Discharge Measurements—Made by wading at all stages.

Regulation—This section only receives part of the flow from the drainage basin above it, part of the water on the basin coming through the Eugenia Power Plant. For this reason the area tributary to this section is not determinable.

Observer—George Dawson, Markdale.

Discharge Measurements of Beaver River near Eugenia Power House for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
October 16.....	Roberts, E.	35	16	1.00	1.50	16.13
November 13.....	"	35	18	1.25	1.57	23.08
December 5.....	"	30	18	1.38	1.58	24.88 (a)
1919						
January 2.....	"	34	26	1.50	1.75	39.69
February 2.....	"	32	24	1.31	1.75	31.53 (a)
" 24.....	"	32	20	1.75	1.62	35.46
May 14.....	"	54	55	2.99	2.10	163.98
July 4.....	"	40	34	2.44	1.89	83.44
" 7.....	"	45	35	1.97	1.85	69.64
" 15.....	"	41	26	1.42	1.71	37.40
September 9.....	"	35	16	.93	1.50	14.90

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Beaver River near Eugenia Power House for year ending
September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1.49	15	1.53	19	1.77	53	1.69	.....	1.79	.....	1.78	54	2.12	175	2.17	203	2.00	116	1.75	49	1.73	45	1.71	42
2	1.50	16	1.55	22	1.75	49	1.71	.....	1.87	.....	1.81	60	2.12	175	2.21	203	2.00	116	1.75	49	1.73	45	1.71	42
3	1.50	16	1.57	24	1.71	42	1.71	.....	1.83	.....	1.79	56	2.08	154	2.21	226	2.00	116	1.75	49	1.73	45	1.71	42
4	1.48	15	1.62	30	1.54	20	2.23	.....	1.77	.....	1.79	56	2.08	154	2.29	270	1.96	103	1.75	49	1.73	45	1.71	42
5	1.52	18	1.59	26	1.55	22	2.52	.....	1.81	.....	1.75	49	2.08	154	2.29	270	2.02	126	1.75	49	1.73	45	1.71	42
6	1.51	17	1.56	23	1.62	30	2.67	.....	1.83	.....	1.83	66	1.92	90	2.33	293	2.06	126	1.75	49	1.73	45	1.67	36
7	1.50	18	1.56	23	1.64	32	2.64	.....	1.83	.....	1.75	49	1.92	90	2.29	270	2.00	116	1.85	70	1.73	45	1.67	36
8	1.52	16	1.61	28	1.59	26	1.96	.....	1.83	.....	1.75	49	1.92	90	2.29	270	2.00	116	1.75	49	1.73	45	1.67	36
9	1.50	16	1.69	39	1.67	36	2.21	.....	1.71	.....	1.64	32	1.92	90	2.25	248	1.96	103	1.75	49	1.73	45	1.67	36
10	1.50	16	1.64	32	1.67	36	2.21	.....	1.71	.....	1.83	66	1.98	109	2.31	282	1.96	103	1.75	49	1.71	42	1.67	36
11	1.50	16	1.68	37	1.71	42	2.31	.....	1.67	.....	1.71	42	2.06	145	2.33	293	1.92	90	1.75	49	1.71	42	1.67	36
12	1.50	16	1.59	26	1.56	23	2.33	.....	1.83	.....	1.71	42	2.06	145	2.29	270	1.92	90	1.75	49	1.71	42	1.67	36
13	1.56	23	1.57	24	1.64	32	2.21	.....	1.77	.....	1.75	49	2.17	203	2.19	214	1.87	76	1.75	49	1.71	42	1.67	36
14	1.50	16	1.54	20	1.92	90	2.10	.....	.....	.....	1.75	49	2.19	203	2.10	164	1.87	76	1.75	49	1.71	42	1.67	36
15	1.50	16	1.54	20	1.87	76	2.10	.....	.....	.....	1.75	49	2.19	203	2.08	154	1.87	76	1.75	49	1.71	42	1.67	36
16	1.50	16	1.54	20	1.77	53	2.08	.....	1.67	.....	2.02	126	2.25	248	2.17	203	1.87	76	1.75	49	1.71	42	1.67	36
17	1.50	16	1.55	22	1.70	40	1.77	.....	1.67	.....	2.12	175	2.17	203	2.24	242	1.87	76	1.75	49	1.73	45	1.67	36
18	1.50	16	1.59	26	1.66	35	1.69	.....	1.67	.....	2.18	209	2.17	203	2.14	186	1.83	66	1.73	45	1.75	49	1.67	36
19	1.49	15	1.66	35	1.61	28	1.62	.....	1.67	.....	2.21	226	2.17	203	2.14	186	1.81	60	1.73	45	1.75	49	1.67	36
20	1.64	32	1.65	34	1.58	25	1.73	.....	1.85	.....	2.08	154	2.17	203	2.19	214	1.79	56	1.73	45	1.75	49	1.67	36
21	1.55	22	1.62	30	1.59	26	1.71	.....	1.71	.....	2.08	154	2.17	203	2.17	203	1.79	56	1.73	45	1.75	49	1.67	36
22	1.56	23	1.54	20	1.79	56	1.71	.....	1.69	.....	2.00	116	2.17	203	2.17	203	1.79	56	1.73	45	1.75	49	1.67	36
23	1.42	10	1.53	19	1.77	53	1.79	.....	1.71	.....	2.10	164	2.17	203	2.12	175	1.79	56	1.73	45	1.75	49	1.67	36
24	1.42	10	1.56	23	1.70	40	1.79	.....	1.62	.....	2.06	145	2.19	214	2.12	175	1.77	53	1.73	45	1.75	49	1.67	36
25	1.42	10	1.57	24	1.94	96	1.83	.....	1.62	.....	2.17	203	2.17	203	2.08	154	1.78	54	1.73	45	1.75	49	1.67	36
26	1.42	10	1.56	23	2.00	116	1.75	.....	1.62	.....	2.21	226	2.17	203	2.08	154	1.79	56	1.73	45	1.75	49	1.67	36
27	1.54	20	1.52	18	2.12	175	1.73	.....	1.83	.....	2.21	226	2.17	203	2.08	154	1.79	56	1.69	39	1.75	49	1.67	36
28	1.59	26	1.52	18	2.02	126	1.71	.....	1.75	.....	2.17	203	2.17	203	2.08	154	1.77	53	1.73	45	1.75	49	1.67	36
29	1.58	25	1.59	26	1.85	70	1.71	.....	.....	.....	2.17	203	2.17	203	2.08	154	1.75	49	1.73	45	1.75	49	1.67	36
30	1.54	20	1.48	25	1.70	40	1.67	.....	.....	.....	2.17	203	2.12	175	2.04	135	1.75	49	1.73	45	1.75	49	1.67	36
31	1.52	18	.....	.....	1.60	27	1.67	.....	.....	.....	2.08	154	.....	.....	2.04	135	.....	.....	1.73	45	1.71	42	.....	.....

Monthly Discharge of Beaver River near Eugenia Power House for
year ending September 30th, 1919

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area.
October (1918)	32	10	17	.....	.....	.....	.....
November “	39	18	25	.....	.....	.....	.....
December “	175	20	52	.....	.....	.....	.....
January .. (1919)	.....	.....	.....	.....	.....	.....	.....
February .....	.....	.....	.....	.....	.....	.....	.....
March	226	32	118	.....	.....	.....	.....
April	248	90	174	.....	.....	.....	.....
May	293	135	208	.....	.....	.....	.....
June	126	49	80	.....	.....	.....	.....
July	70	39	48	.....	.....	.....	.....
August	49	42	46	.....	.....	.....	.....
September	42	36	37	.....	.....	.....	.....
The period.....	293	10	81	.....	.....	.....	.....

Beaver River near Kimberley

Location—At Hill's bridge, about 2 miles above Kimberley, on the south half of lot 2, concession 5, Township of Euphrasia, County of Grey.

Records Available—Discharge measurements at Weber's Bridge, September, 1914, to January, 1915. Discharge measurements April 25, 1915, to date, at Hill's Bridge. Daily gauge heights from April 25, 1915.

Drainage Area—100 square miles.

Gauge—Vertical staff 0 to 6 feet on tree on left bank 20 feet downstream from bridge. Zero of gauge is 0.00.

Channel and Control—Channel straight above and below for a distance of 200 feet. The banks and control are permanent under ordinary conditions. The bed is composed of stones and gravel, one channel existing at all stages.

Discharge Measurements—Made from the bridge during the high-water period, and from a permanent wading section located 20 feet above the bridge for the low-water stages.

Regulation—The Hydro-Electric Power Commission's power plant located three-quarters of a mile upstream, though a twenty-four hour power, has a marked effect on the river stage at this section.

Accuracy—The rating curve is fairly well defined, but open-water estimates are subject to errors, due to fluctuations in stage caused by operation of power plant.

Observer—Mrs. Annie Turner, Kimberley P.O.

Discharge Measurements of Beaver River near Kimberley for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
October 16.....	Roberts, E.	57	46	2.23	.96	103
December 5.....	"	58	49	2.56	1.05	124
1919						
January 2.....	"	58	59	2.36	1.17	142
February 2.....	"	58	36	1.95	.77	71
" 24.....	"	58	55	2.04	1.08	113 (a)
June 14.....	"	58	50	2.59	1.17	131
September 9.....	"	57	42	2.26	.92	94

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Beaver River near Kimberley for year ending September 30th, 1919

Date	October			November			December			January			February			March			April			May			June			July			August			September		
	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.			
1	.92	89	76	.83	81	95	1.04	108	108	.87	81	95	1.08	115	1.75	243	1.42	175	1.17	129	.67	52	64	.92	89											
2	.92	89	76	.83	81	95	1.04	108	108	1.12	121	143	.87	81	1.75	243	1.50	190	1.25	143	.83	76	.75	64	.92	89										
3	.96	95	70	.79	70	88	.87	76	76	1.04	108	127	147	125	143	1.75	243	1.50	190	1.29	150	.83	76	.62	46											
4	.92	89	81	1.00	101	95	.87	81	81	1.33	158	85	1.42	175	1.71	234	1.96	295	1.21	137	.79	70	.71	58	.87	82										
5	.92	89	81	1.00	101	95	.87	81	81	1.10	118	92	1.17	130	1.75	243	2.12	337	1.17	129	.83	76	.75	65	.87	82										
6	.67	52	89	.92	89	81	.83	76	76	1.46	182	92	1.17	130	1.12	121	2.00	305	1.50	190	1.04	108	.75	65	.92	89										
7	.96	95	95	.96	95	95	1.12	121	121	1.04	108	89	1.21	137	1.29	150	1.92	285	1.33	158	1.08	115	.67	52	.79	70										
8	.92	89	81	1.08	115	83	.83	76	76	1.04	108	101	1.33	158	1.33	158	1.79	253	1.25	143	.92	89	.71	58	.87	82										
9	1.00	101	101	1.29	150	108	1.00	101	101	.92	89	70	.92	89	1.33	158	1.87	272	1.33	158	.87	82	.75	65	.79	70										
10	.92	89	81	1.04	108	108	1.08	115	115	1.37	165	92	1.04	108	1.58	206	1.79	253	1.25	143	.83	76	.79	70	.67	52										
11	.92	89	81	.95	95	95	1.00	101	101	1.21	137	130	.94	92	1.79	253	1.71	234	1.25	143	.83	76	.83	76	.87	82										
12	.92	89	81	1.08	115	95	.96	95	95	1.50	190	94	.92	89	1.87	272	1.67	225	1.17	129	.79	70	.96	95	.96	95										
13	.83	76	101	1.04	108	101	1.00	101	101	1.58	206	92	1.12	121	1.83	262	1.62	214	1.17	129	.79	70	.96	95	.96	95										
14	.83	76	101	1.00	101	101	1.00	101	101	1.00	101	101	1.25	143	1.87	272	1.54	198	1.12	121	.83	76	1.00	101	1.00	101										
15	.96	95	95	.96	95	95	1.29	150	150	.96	95	95	1.17	130	1.75	243	1.62	214	1.08	115	.83	76	1.00	101	.87	82										
16	.96	95	95	.96	95	95	1.21	137	137	.96	95	83	1.58	206	2.21	362	1.58	206	1.08	115	.83	76	1.00	101	.92	89										
17	.86	81	101	.75	64	108	1.08	115	115	.87	81	92	2.29	386	1.92	285	1.71	234	1.08	115	.79	70	.87	82	.92	89										
18	.92	89	81	1.04	108	101	1.04	108	108	.94	92	96	2.54	469	1.83	262	1.54	198	1.04	108	.83	76	1.00	101	.92	89										
19	.87	81	121	1.12	121	108	1.04	108	108	.79	70	94	1.96	295	1.79	253	1.54	198	1.04	108	.71	58	1.04	108	.96	95										
20	.96	95	108	1.08	115	108	1.08	115	115	.92	89	118	2.08	326	1.75	243	1.92	285	1.17	129	.75	64	1.04	108	.96	95										
21	1.00	101	101	1.00	101	101	1.08	115	115	.87	81	92	2.17	351	1.79	253	1.83	262	1.17	129	.75	64	1.04	108	.92	89										
22	.87	81	95	.96	95	95	1.25	143	143	.96	95	100	1.67	225	1.62	214	2.04	315	.96	95	.79	70	1.00	101	1.00	101										
23	.96	95	89	.92	89	81	1.33	158	158	1.21	137	93	1.87	272	1.62	214	1.87	272	.92	89	.71	58	1.00	101	1.00	101										
24	.92	89	81	.87	81	81	1.17	130	130	1.25	143	96	2.00	305	1.58	206	1.58	206	1.04	108	.75	64	.92	89	1.00	101										
25	.83	76	76	.83	76	76	.92	89	89	1.21	137	96	2.17	351	1.62	214	1.50	190	1.08	115	.75	64	.96	95	1.00	101										
26	.83	76	76	.92	89	81	1.04	108	108	.83	76	95	2.17	351	1.54	198	1.62	214	1.04	108	.83	76	.96	95	1.00	101										
27	.75	64	83	.76	76	76	1.12	121	121	1.08	115	108	2.46	441	1.42	175	1.54	198	1.00	101	.50	32	.96	95	1.00	101										
28	.96	95	95	.92	89	81	1.08	115	115	1.00	101	1.79	2.08	326	1.54	198	1.37	165	.92	89	.79	70	.96	95	1.00	101										
29	.96	95	95	1.00	101	101	1.00	101	101	1.00	101	.....	2.00	305	1.54	198	1.37	165	.67	52	.79	70	.96	95	1.00	101									
30	.96	95	89	.92	89	81	1.04	108	108	1.00	101	.....	1.75	243	1.46	182	1.42	175	.83	76	.79	70	.96	95	1.00	101									
31	.92	89	89	.....	.....	.....	1.00	101	101	.96	95	.....	1.79	253	.....	.....	1.33	158	.....	.....	.79	70	.92	89	.....	.....								

**Monthly Discharge of Beaver River at Kimberley for year ending
September 30th, 1919**

Drainage Area, 100 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October... (1918)	101	52	87	1.01	.52	.87	1.00
November "	150	64	96	1.50	.64	.96	1.07
December "	285	76	114	2.85	.76	1.14	1.31
January .. (1919)	206	70	115	2.06	.70	1.15	1.33
February	147	70	98	1.47	.70	.98	1.02
March	469	81	224	4.69	.81	2.24	2.58
April	362	121	225	3.62	1.21	2.25	2.51
May	337	158	230	3.37	1.58	2.30	2.65
June	190	52	122	1.90	.52	1.22	1.36
July	115	32	72	1.15	.32	.72	.83
August	108	46	85	1.08	.46	.85	.98
September	101	52	90	1.01	.52	.90	1.00
The year	469	32	130	4.69	.32	1.30	17.65

Credit River at Cataract Junction

Location—About 500 feet from C.P.R. station at Cataract Junction, lot 14, concession 3, Township of Caledon, County of Peel.

Records Available—Discharge measurements from June, 1912. Daily gauge heights from May 7, 1915.

Drainage Area—85 square miles.

Gauge—Vertical staff 0 to 6 feet on tree on right bank. Zero of gauge (elevation 8.00) is referred to a B.M. (elevation 10.00) painted on rock 100 feet downstream from metering section.

Channel and Control—The channel is straight for about 350 feet above and 300 feet below the section. The right bank is low, and overflows during high stages. The bed is composed of gravel, which is shifting during flood stages.

Discharge Measurements—Made at permanent wading section at all stages.

Winter Flow—Relation of gauge height to discharge is affected by ice, and measurements are made to determine this flow.

Regulation—The dam at Erin, about four miles upstream, causes serious fluctuations in the river stage at this section. Semi-daily gauge readings will not give a representative mean.

Accuracy—A fairly well-defined rating curve has been established for this station. The accuracy of the estimates of discharge depends upon the accuracy of the mean daily gauge heights.

Observer—Alfred Riches, Cataract Junction.

Discharge Measurements of Credit River at Cataract Junction for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 22.....	Roberts, E.....	40	30	1.72	8.71	51
1919						
Jan. 15.....	"	22	26	1.53	9.04	54 (a)
Feb. 19.....	"	40	42	.69	8.96	29 (a)
May 25.....	"	41	37	2.22	8.86	81
Sept. 17.....	"	41	20	1.06	8.50	21

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Credit River at Cataract Junction for year ending
September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	8.55	24	8.67	36	8.73	31	8.77	26	8.69	16	8.73	31	8.75	47	8.64	32	8.62	30	8.54	23	8.46	18	8.44	18
2	8.58	26	8.58	26	8.69	27	8.80	28	8.83	22	8.77	36	8.71	41	8.81	57	8.60	28	8.54	23	8.46	18	8.50	20
3	8.56	25	8.55	24	8.63	22	8.77	26	8.83	22	8.77	36	8.71	41	8.81	57	8.60	28	8.54	23	8.46	18	8.50	20
4	8.58	26	8.65	33	8.64	23	9.46	172	8.59	12	8.85	47	8.73	44	9.37	209	8.60	28	8.52	22	8.42	17	8.50	20
5	8.52	22	8.71	41	8.77	26	9.98	381	8.67	15	9.11	101	8.75	47	9.39	216	8.58	26	8.50	20	8.50	20	8.46	18
6	8.57	26	8.63	31	8.71	29	10.17	475	8.61	12	9.12	103	8.75	53	9.02	103	9.10	124	8.50	20	8.50	20	8.46	18
7	8.68	37	8.65	33	8.85	47	10.21	495	8.71	16	9.00	75	8.92	80	8.85	65	9.35	202	8.60	28	8.46	18	8.46	18
8	8.64	32	8.62	30	8.68	26	9.85	322	8.81	21	8.89	53	8.89	73	8.81	57	8.94	84	8.56	25	8.46	18	8.42	17
9	8.58	26	8.68	37	8.71	29	9.56	205	8.69	16	8.67	26	8.96	89	8.75	47	8.81	57	8.56	25	8.42	17	8.44	18
10	8.54	23	8.72	42	9.12	103	9.85	322	8.83	22	8.73	31	9.08	119	8.77	50	8.73	44	8.50	20	8.42	17	8.44	18
11	8.55	24	8.68	37	9.00	75	9.47	175	8.97	36	8.71	29	9.37	209	9.35	202	8.67	36	8.52	22	8.46	18	8.46	18
12	8.55	24	8.65	33	8.69	27	9.64	234	8.62	13	8.75	34	9.12	130	9.23	163	8.67	36	8.46	18	8.46	18	8.46	18
13	8.51	21	8.60	28	8.67	26	9.17	91	8.54	10	8.77	36	8.98	93	8.98	93	8.62	30	8.48	19	8.44	18	8.46	18
14	8.54	23	8.54	23	8.81	41	9.59	216	8.53	9	8.87	50	8.87	69	8.85	65	8.58	26	8.54	23	8.46	18	8.44	18
15	8.56	25	8.59	27	9.12	103	9.06	49	8.66	18	8.81	41	8.83	61	8.77	50	8.56	25	8.54	23	8.46	18	8.44	18
16	8.54	23	8.59	27	9.00	75	9.12	75	8.79	27	8.85	47	9.04	108	8.75	47	8.60	28	8.52	22	8.46	18	8.46	18
17	8.60	28	8.59	27	8.93	61	8.92	30	8.81	29	9.96	470	9.50	257	8.85	65	8.54	23	8.50	20	8.60	28	8.42	17
18	8.56	25	8.64	32	8.81	41	8.69	16	8.64	18	13.75	2360	9.12	130	8.81	57	8.56	25	8.50	20	8.67	36	8.42	17
19	8.54	23	8.65	33	8.72	30	8.62	13	8.79	27	10.42	700	8.96	89	8.75	47	8.54	23	8.46	18	8.54	23	8.44	18
20	8.68	37	8.62	30	8.63	22	8.73	17	8.92	42	10.25	615	8.87	69	8.83	61	8.56	25	8.46	18	8.56	25	8.50	20
21	8.69	38	8.60	28	8.67	26	8.61	12	8.61	16	10.17	575	8.81	57	9.06	114	8.58	26	8.54	23	8.56	25	8.50	20
22	8.65	33	8.56	25	9.00	75	8.61	12	8.67	19	9.64	317	8.77	50	9.21	156	8.52	26	8.54	23	8.56	25	8.50	20
23	8.57	26	8.54	23	9.19	121	8.71	16	8.56	14	9.48	249	8.75	47	9.12	130	8.58	26	8.50	20	8.58	26	8.60	28
24	8.54	23	8.52	22	8.94	63	8.85	24	8.61	16	9.35	202	8.75	47	8.96	89	8.54	23	8.50	20	8.54	23	8.46	18
25	8.57	26	8.62	30	8.80	28	8.94	32	8.58	15	9.31	188	8.71	41	8.87	69	8.58	26	8.46	18	8.50	20	8.52	22
26	8.65	33	8.58	26	8.94	45	8.81	21	8.79	27	9.29	182	8.69	38	8.81	57	8.77	50	8.54	23	8.54	23	8.52	22
27	8.58	26	8.56	25	9.00	55	8.73	17	8.83	31	9.56	282	8.73	44	8.75	47	8.67	36	8.46	18	8.50	20	8.46	18
28	8.60	28	8.62	22	8.94	45	8.62	13	8.62	17	9.19	182	8.73	44	8.73	44	8.58	26	8.54	23	8.48	19	8.54	23
29	8.61	57	8.60	28	8.81	29	8.67	15	.....	.....	9.10	124	8.81	57	8.69	38	8.56	25	8.54	23	8.48	19	8.50	20
30	8.69	38	8.71	29	8.64	18	8.60	12	.....	.....	9.00	98	8.73	44	8.67	36	8.58	26	8.50	20	8.46	18	8.50	20
31	8.73	44	.....	.....	8.79	27	8.67	15	.....	.....	8.83	61	.....	.....	8.60	28	.....	.....	8.50	20	8.48	19	.....	.....

Monthly Discharge of Credit River at Cataract Junction for year ending September 30th, 1919

Drainage Area, 85 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	57	21	29	.67	.25	.34	.39
November "	42	20	29	.49	.24	.34	.38
December "	121	18	45	1.42	.21	.53	.61
January (1919)	495	12	114	5.82	.14	1.34	1.54
February	42	9	20	.49	.11	.24	.25
March	2,360	26	238	27.76	.31	2.80	3.23
April	257	38	77	3.02	.45	.91	1.02
May	216	28	82	2.54	.33	.96	1.11
June	202	22	41	2.38	.26	.48	.54
July	28	18	22	.33	.21	.26	.30
August	36	17	20	.42	.20	.24	.28
September	28	17	19	.33	.20	.22	.24
The year	2,360	9	62	27.76	.11	.73	9.91

Rocky Saugeen River near Markdale

Location—At the Glen Cross highway bridge, three-quarters of a mile above Hayward's Falls, near lot 5, concession 8, Township of Glenelg, County of Grey.

Records Available—Discharge measurements and daily gauge heights from June 8, 1915.

Drainage Area—96 square miles.

Gauge—Vertical staff 0 to 6 feet on the downstream side of the centre pier of bridge. The zero of gauge (elevation 0.00) is referred to a B.M. (elevation 29.65) painted on a rock projecting from bank 40 feet north from first telephone pole on left bank.

Channel and Control—The channel is straight for 200 feet above and 500 feet below the station. The bed and banks are permanent, as flood conditions do not exist on this stream.

Discharge Measurements—Made at a permanent wading section. When the river is extremely high measurements will be made from the bridge.

Winter Flow—Ice has but little effect at this section and the open water curve is at all times applicable.

Regulation—The dam above has little effect on the river stage at this section.

Accuracy—The rating curve is well defined except for maximum flows.

Observer—Mrs. Elizabeth Jack, Markdale.

Discharge Measurements of Rocky Saugeen River near Markdale for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 1.....	Roberts, E.	72	70	.90	1.27	63
December 4.....	"	74	80	1.03	1.46	82
1919						
January 1.....	"	78	110	1.13	1.75	124
February 1.....	"	77	107	1.16	1.71	124
" 22.....	"	71	90	1.13	1.50	101
May 9.....	"	82	146	1.48	2.21	218
" 16.....	"	81	122	1.23	1.92	151
" 19.....	"	81	128	1.32	2.00	169
September 11.....	"	65	55	.82	1.14	45

Daily Gauge Height in feet and Discharge in second-feet of Rocky Saugeen River near Markdale for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
1	1.33	68	1.29	64	1.33	68	1.75	128	1.42	79	1.46	84	2.75	355	2.00	173	1.75	128	1.46	84	1.25	60	1.25	60
2	1.25	60	1.17	54	1.33	68	2.00	173	1.75	128	1.50	89	2.29	233	2.08	188	1.75	128	1.46	79	1.25	60	1.25	60
3	1.17	54	1.25	60	1.42	79	1.75	128	1.75	128	1.79	135	2.25	224	2.21	215	1.67	115	1.42	79	1.33	68	1.21	57
4	1.17	54	1.46	84	1.33	68	1.58	101	1.67	115	1.83	142	2.25	224	2.50	285	1.67	115	1.46	84	1.29	64	1.25	60
5	1.17	54	1.42	79	1.25	60	1.58	101	1.42	79	1.67	115	2.25	224	2.46	275	1.75	128	1.42	79	1.33	68	1.25	60
6	1.25	60	1.33	68	1.25	60	1.58	101	1.58	101	1.67	115	2.42	264	2.33	242	1.75	128	1.58	101	1.21	57	1.17	54
7	1.42	79	1.42	79	1.42	79	1.75	128	1.42	79	1.50	89	2.37	252	2.33	242	1.75	128	1.50	89	1.25	60	1.17	54
8	1.33	68	1.42	79	1.46	84	1.60	104	1.42	79	2.00	173	2.37	252	2.25	224	1.79	135	1.50	89	1.25	60	1.17	54
9	1.25	60	1.67	115	1.50	89	1.58	101	1.42	79	1.67	115	2.42	264	2.17	207	1.67	115	1.50	89	1.23	59	1.17	54
10	1.25	60	1.71	122	1.33	68	1.62	107	1.58	101	1.75	128	2.50	285	2.08	188	1.67	115	1.50	89	1.23	59	1.17	54
11	1.25	60	1.58	101	1.39	75	1.67	115	1.58	101	1.75	128	2.58	307	2.00	173	1.62	107	1.33	68	1.21	57	1.17	54
12	1.17	54	1.71	122	1.33	68	1.67	115	1.67	115	1.75	128	2.50	285	2.00	173	1.58	101	1.33	68	1.25	60	1.17	54
13	1.25	60	1.58	101	1.37	73	1.58	101	1.83	142	1.75	128	2.42	264	2.00	173	1.67	115	1.33	68	1.21	57	1.25	60
14	1.33	68	1.46	84	2.00	173	1.62	107	1.58	101	1.92	159	2.29	233	2.04	181	1.67	115	1.37	73	1.25	60	1.17	54
15	1.33	68	1.58	101	2.00	173	1.62	107	1.62	107	1.79	135	2.25	224	2.00	173	1.50	89	1.37	73	1.33	68	1.33	68
16	1.25	60	1.50	89	1.96	166	1.58	101	1.54	95	2.08	188	2.33	242	1.92	159	1.58	101	1.42	79	1.33	68	1.25	60
17	1.33	68	1.46	84	2.00	173	1.58	101	1.58	101	3.08	450	2.33	242	2.08	188	1.58	101	1.42	79	1.33	68	1.25	60
18	1.25	60	1.46	84	1.92	159	1.62	107	1.58	101	3.08	450	2.33	242	2.08	188	1.58	101	1.42	79	1.33	68	1.25	60
19	1.08	48	1.67	115	1.83	142	1.58	101	1.83	142	3.00	430	2.25	224	2.00	173	1.62	107	1.33	68	1.42	79	1.21	57
20	1.42	79	1.58	101	1.83	142	1.67	115	1.83	142	3.08	454	2.21	215	2.21	215	1.50	89	1.33	68	1.33	68	1.17	54
21	1.42	79	1.50	89	1.75	128	1.54	95	1.83	142	3.42	555	2.25	224	2.08	188	1.62	107	1.29	64	1.37	73	1.17	54
22	1.42	79	1.58	101	2.00	173	1.58	101	1.54	95	2.92	406	2.17	207	2.25	224	1.50	89	1.39	73	1.33	68	1.42	79
23	1.58	101	1.58	101	2.08	188	1.92	159	1.54	95	2.92	406	2.08	188	2.21	215	1.50	89	1.39	73	1.33	68	1.25	60
24	1.25	60	1.42	79	2.00	173	1.96	166	1.50	89	2.79	367	2.00	173	2.08	188	1.58	101	1.37	73	1.33	68	1.25	60
25	1.17	54	1.40	76	2.00	173	1.54	95	1.58	101	2.79	367	2.00	173	2.08	188	1.58	101	1.25	60	1.25	60	1.25	60
26	1.17	54	1.33	68	1.92	159	1.79	135	1.67	115	2.92	406	2.00	173	2.00	173	1.58	101	1.25	60	1.25	60	1.25	60
27	1.25	60	1.25	60	1.92	159	1.83	138	1.62	107	2.92	406	2.00	173	1.92	159	1.58	101	1.42	79	1.33	68	1.21	57
28	1.33	68	1.29	64	1.83	142	.....	.....	1.50	89	2.83	379	2.17	207	1.83	142	1.58	101	1.33	68	1.33	68	1.17	54
29	1.25	60	1.50	89	1.75	128	1.79	135	.....	.....	2.58	307	2.17	207	1.83	142	1.50	89	1.33	68	1.29	64	1.21	57
30	1.25	65	1.33	68	1.83	142	1.75	128	.....	.....	2.58	307	2.21	215	1.83	142	1.50	89	1.33	68	1.25	60	1.17	54
31	1.25	60	.....	.....	1.75	128	1.75	128	.....	.....	2.50	285	.....	.....	1.75	128	.....	.....	1.25	60	1.25	60	.....	.....

**Monthly Discharge of Rocky Saugeen River at Markdale for year
ending September 30th, 1919**

Drainage Area, 96 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	101	48	64	1.05	.50	.67	.77
November "	122	54	86	1.27	.56	.90	1.00
December "	188	60	121	1.96	.62	1.26	1.45
January (1919)	173	95	118	1.80	.99	1.23	1.42
February	142	79	105	1.48	.82	1.09	1.13
March	555	84	254	5.78	.87	2.65	3.06
April	355	173	233	3.70	1.80	2.43	2.71
May	285	128	191	2.97	1.33	1.99	2.29
June	135	89	107	1.41	.93	1.11	1.24
July	101	60	75	1.05	.62	.78	.90
August	79	57	64	.82	.59	.67	.77
September	79	54	58	.82	.56	.60	.67
The year.....	555	48	123	5.78	.50	1.28	17.44

Saugeen River near Port Elgin

Location—At the highway bridge known as McCaider's Bridge, 4 miles north-east of the Town of Port Elgin, near lot 5, concession 12, Township of Saugeen, County of Bruce.

Records Available—Discharge measurements from July, 1911. Daily gauge heights from April 19, 1914.

Drainage Area—1,565 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment downstream side. Zero of gauge (elevation 4.00) is referred to a B.M. (elevation 25.00) painted on wooden hand-rail of bridge.

Channel and Control—The channel is straight for about 350 feet above and below the section. The bed of the stream, with two submerged piers at the section, is composed of fairly large boulders, which will only shift during high flood stages. The current is moderate and flows through two channels, which are separated by the centre pier of the bridge.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice greatly affects relation of gauge height to discharge. Measurements are made during the winter to determine the flow.

Regulation—Fluctuations occur in the river stage at this section. This is no doubt caused by the plants at Walkerton, Chesley and Paisley.

Accuracy—Semi-daily reading should give a fair representative mean. The fluctuations that have been noted are not large, consequently the gauge height records can be classified as good. A well-defined curve is shown for flows up to 20,000 sec. feet. A slight angle in cross-section No. 1, may affect accuracy of meter measurements.

Observer—John Shanks, Southampton.

Discharge Measurements of Saugeen River near Port Elgin for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 14.....	Roberts, E.	197	1,004	1.73	6.52	1,736
1919						
January 31.....	"	197	1,420	1.42	8.67	2,011 (a)
February 12.....	"	187	1,006	1.07	6.85	1,077 (a)
March 19.....	"	221	2,492	5.78	13.46	14,408
" 20.....	"	221	2,270	5.15	12.52	11,680
" 21.....	"	221	2,204	4.89	12.20	10,770
May 18.....	"	197	1,003	1.85	6.54	1,855
September 11.....	"	169	601	.62	4.50	374

(a) Ice measurement.

Monthly Discharge of Saugeen River near Port Elgin for year
ending September 30th, 1919

Drainage Area, 1,565 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	1,110	550	766	.71	.35	.49	.56
November "	2,920	1,080	1,722	1.87	.69	1.10	1.23
December "	6,510	1,280	2,841	4.16	.82	1.82	2.10
January (1919)	7,600	1,790	3,409	4.86	1.14	2.18	2.51
February	3,600	780	1,431	2.30	.50	.91	.95
March.....	18,740	1,580	6,124	11.97	1.01	3.91	4.51
April.....	5,150	1,800	3,012	3.29	1.15	1.92	2.14
May	5,740	1,230	2,503	3.67	.79	1.60	1.84
June	1,080	448	735	.69	.29	.47	.52
July.....	780	298	458	.50	.19	.29	.33
August	620	202	358	.40	.13	.23	.26
September.....	1,080	202	385	.69	.13	.25	.28
The year	18,740	202	1,989	11.97	.13	1.27	17.24

Saugeen River near Walkerton

Location—At the south line bridge, $2\frac{1}{2}$ miles above the Town of Walkerton, near lot 39, concession 2, Township of Brant, County of Bruce.

Records Available—Discharge measurements from June, 1912. Daily gauge heights from March 26, 1914.

Drainage Area—850 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment. Zero of the gauge is 14.00 feet, which is referred to a B.M. (elevation 35.00) on tension rod of bridge.

Channel and Control—Channel is straight for about 500 feet above and below the section. Both banks are high, and do not overflow. The river bed is composed of clay, one channel existing at all stages.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice greatly affects relation of gauge height to discharge. Measurements are made to determine the winter flow.

Regulation—The dam above Walkerton, about $1\frac{1}{2}$ miles downstream has no effect on the river stage at this section.

Accuracy—Weeds below this section have a gradually changing effect on the velocity.

Observer—James Preston, Walkerton.

Discharge Measurements of Saugeen River near Walkerton for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
November 16..... 1918	Roberts, E....	125	556	1.25	16.19	695
January 30..... 1919	"	130	647	1.77	16.92	1,143
February 11.....	"	123	517	.92	15.92	467 (a)
March 18.....	"	135	1,728	5.63	25.08	9,725
" 19.....	"	135	1,512	4.89	23.39	7,388
" 20.....	"	135	1,448	4.46	22.79	6,453
" 21.....	"	135	1,485	4.84	23.25	7,186
April 7.....	"	130	814	2.51	18.17	2,043
May 19.....	"	127	705	1.83	17.33	1,291
September 11.....	"	103	389	.56	15.04	217

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Saugeen River near Walkerton for year ending September 30th, 1919

Day	October			November			December			January			February			March			April			May			June			July			August			September																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Monthly Discharge of Saugeen River at Walkerton for year ending September 30th, 1919

Drainage Area, 850 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October .. (1918)	785	258	449	.92	.30	.53	.61
November "	1,500	515	912	1.77	.61	1.07	1.19
December "	4,250	660	1,645	5.00	.77	1.94	2.24
January .. (1919)	1,560	665	1,008	1.84	.78	1.19	1.37
February	820	426	625	.96	.50	.74	.77
March	9,200	980	3,177	10.82	1.15	3.74	4.31
April	3,910	1,060	1,885	4.60	1.25	2.22	2.48
May.....	3,790	705	1,564	4.46	.83	1.84	2.12
June.....	680	338	492	.80	.40	.58	.65
July.....	580	206	334	.68	.24	.39	.45
August.....	438	93	287	.52	.11	.34	.39
September.....	430	190	254	.51	.22	.30	.30
The year	9,200	93	1,058	10.82	.11	1.24	16.90

Sydenham River near Owen Sound

Location—At the highway bridge above the Town of Owen Sound's filtration plant, near lot 9, concession 1, Township of Derby, County of Grey.

Records Available—Discharge measurements and daily gauge heights from June 9, 1915.

Drainage Area—71 square miles.

Gauge—Vertical staff 0 to 6 feet on upstream side of first pier from right abutment. Zero on the gauge is 0.00.

Channel and Control—The channel is straight for 200 feet above and below the section. Both banks are low, but do not overflow, the stream never assuming flood proportions. The bed is composed of solid rock, with two channels during the low-water period. During the high-water stages all the water is confined between the two abutments of the bridge.

Discharge Measurements—Made from the bridge during the high-water period, and from a permanent wading section located 30 feet upstream during the low stages.

Winter Flow—Ice has little effect.

Regulation—The Town of Owen Sound has a dam 300 feet above this section that is used to supply water for domestic uses.

Diversions—An additional 750,000 gallons of water per day should be added to the daily flow at this section, which is the approximate amount diverted.

Accuracy—There are not sufficient readings to define a curve at all stages. Discharges between gauge heights .90 and 2.00 are fair.

Observer—Myrtle McClintock, Owen Sound.

Discharge Measurements of Sydenham River near Owen Sound for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 14.....	Roberts, E.....	53	40	1.50	1.25	60
Dec. 9.....	".....	54	41	1.83	1.39	75
1919						
Jan. 4.....	".....	53	49	1.75	1.54	86 (a)
Feb. 1.....	".....	48	51	2.59	1.62	142
" 26.....	".....	49	35	1.49	1.29	52 (a)
Mar. 4.....	".....	62	73	2.58	1.79	189
Apr. 4.....	".....	63	64	2.61	1.71	168
May 17.....	".....	55	51	1.86	1.50	95
Sept. 10.....	".....	37	15	.75	.83	11

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Sydenham River near Owen Sound for year ending
September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	.92	19	1.04	30	1.25	56	1.42	87	1.50	105	1.58	101	1.62	136	1.42	87	1.17	45	.92	19	.92	19	.87	15
2	.92	19	1.04	30	1.29	62	1.46	96	1.67	152	1.67	122	1.58	125	1.42	87	1.17	45	.92	19	.92	19	.87	15
3	.92	19	1.08	34	1.29	62	1.46	96	1.42	87	1.75	146	1.67	152	1.50	105	1.17	45	.92	19	.87	15	.83	12
4	.92	19	1.17	45	1.25	56	1.50	83	1.42	87	1.75	146	1.58	125	1.67	152	1.12	39	.92	19	.87	15	.83	12
5	.96	22	1.17	45	1.25	56	1.54	92	1.42	87	1.71	133	1.58	125	1.67	152	1.08	34	.92	19	.87	15	.83	12
6	.96	22	1.17	45	1.21	50	1.46	75	1.42	87	1.71	133	1.58	125	1.92	255	1.17	45	.92	19	.87	15	.83	12
7	1.00	26	1.12	39	1.21	50	1.46	75	1.33	70	1.75	146	1.67	152	1.75	146	1.21	50	.92	19	.87	15	.83	12
8	.96	22	1.17	45	1.25	56	1.42	68	1.33	70	1.67	122	1.62	136	1.67	152	1.25	56	.92	19	.83	12	.83	12
9	.92	19	1.37	77	1.37	77	1.37	60	1.33	70	1.50	83	1.71	166	1.58	125	1.25	56	.92	19	.83	12	.83	12
10	.92	19	1.42	87	1.37	77	1.42	68	1.33	70	1.50	83	1.75	180	1.54	115	1.17	45	.92	19	.83	12	.83	12
11	.92	19	1.46	96	1.33	70	1.50	83	1.33	70	1.50	83	1.83	212	1.50	105	1.12	39	.92	19	.83	12	.83	12
12	.92	19	1.33	70	1.33	70	1.50	83	1.33	70	1.50	83	1.83	212	1.50	105	1.08	34	.92	19	.83	12	.83	12
13	.96	22	1.25	56	1.42	87	1.50	83	1.33	70	1.67	122	1.75	180	1.50	105	1.08	34	.92	19	.87	15	.83	12
14	.92	19	1.25	56	1.58	125	1.46	75	1.42	68	1.75	146	1.67	152	1.50	105	1.00	26	.92	19	.87	15	.83	12
15	.92	19	1.25	56	1.87	230	1.42	68	1.42	68	1.67	122	1.67	152	1.46	96	1.04	30	.96	22	.92	19	.83	12
16	.96	22	1.21	50	2.00	297	1.50	83	1.42	68	1.83	173	1.67	152	1.42	87	1.04	30	.92	19	.92	19	.83	12
17	.96	22	1.21	50	1.83	212	1.42	68	1.50	83	3.17	1070	1.75	180	1.42	87	1.00	26	.92	19	.92	19	.83	12
18	.96	22	1.33	70	1.80	199	1.42	68	1.42	68	3.25	1120	1.83	212	1.42	87	1.00	26	.92	19	.92	19	.83	12
19	.96	22	1.50	105	1.80	199	1.42	68	1.42	68	2.83	840	1.83	212	1.37	77	1.00	26	.92	19	.92	19	.83	12
20	1.00	26	1.50	105	1.90	244	1.42	68	1.33	54	2.67	735	1.75	180	1.42	87	.96	22	.92	19	.92	19	.83	12
21	1.08	34	1.54	115	1.90	244	1.42	68	1.33	54	2.42	565	1.67	152	1.42	87	.96	22	.92	19	.96	22	1.00	26
22	1.04	30	1.50	105	1.96	276	1.42	68	1.33	54	2.25	453	1.67	152	1.50	105	.96	22	.92	19	.92	19	1.04	30
23	1.00	26	1.42	87	2.00	297	1.50	105	1.33	54	2.17	400	1.58	125	1.50	105	.96	22	.96	22	.92	19	1.08	34
24	1.00	26	1.37	77	1.83	212	1.67	152	1.33	54	2.00	297	1.58	125	1.58	125	.96	22	.92	19	.87	15	1.00	26
25	1.00	26	1.29	62	1.79	195	1.67	152	1.33	54	1.92	255	1.50	105	1.50	105	.96	22	.92	19	.87	15	.96	22
26	1.04	30	1.21	50	1.58	152	1.83	212	1.46	76	1.83	212	1.54	115	1.50	105	.96	22	1.00	26	.87	15	.92	19
27	1.04	30	1.21	50	1.58	125	1.83	212	1.29	62	1.92	255	1.50	105	1.42	87	1.00	26	.92	19	.87	15	.83	12
28	1.04	30	1.21	50	1.50	105	1.75	180	1.33	54	1.83	212	1.50	105	1.33	70	.96	22	.92	19	.87	15	.83	12
29	1.04	30	1.29	62	1.33	70	1.67	152	.....	.....	1.83	212	1.50	105	1.25	56	1.00	26	.92	19	.87	15	.83	12
30	1.04	30	1.29	62	1.37	77	1.58	125	.....	.....	1.75	180	1.46	96	1.25	56	.96	22	.92	19	.92	19	.87	15
31	1.04	30	.....	.....	1.42	87	1.50	105	.....	.....	1.67	152	.....	.....	1.25	56	.....	.....	.92	19	.92	19	.....	.....

Monthly Discharge of Sydenham River at Owen Sound for year
ending September 30th, 1919

Drainage Area, 71 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October. . . (1918)	34	19	24	.48	.27	.34	.39
November "	115	30	64	1.62	.42	.90	1.00
December "	297	50	135	4.19	.70	1.90	2.19
January .. (1919)	212	60	99	2.99	.85	1.39	1.60
February	152	48	73	2.14	.68	1.03	1.07
March	1,120	83	287	15.77	1.17	4.04	4.66
April	212	96	148	2.99	1.35	2.08	2.32
May	255	56	110	3.59	.79	1.55	1.79
June	56	22	33	.79	.31	.46	.51
July	26	19	20	.37	.27	.28	.32
August	22	12	16	.31	.17	.23	.26
September	34	12	15	.48	.17	.21	.23
The year	1,120	12	86	15.77	.17	1.21	16.37

Thames River (Main Stream) at Kilworth

Location—At the highway bridge known as Kilworth Bridge, 2 miles north-west of the Town of Byron, near the Village of Komoka, Township of Delaware, County of Middlesex.

Records Available—Monthly discharge measurements from March, 1912. Daily gauge heights from March 13, 1914.

Drainage Area—1,270 square miles.

Gauge—Vertical staff 0 to 12 feet on centre pier. The zero of gauge (elevation 6.00), which has remained unchanged since established, is referred to a B.M. (elevation 31.21) on downstream side of right abutment.

Channel and Control—The channel is straight above and below section for about 600 feet. The banks are high, and do not overflow or shift to a great extent. The control, however, is not stationary under high-water conditions. The velocity is high.

Discharge Measurements—Made from bridge at all stages.

Winter Flow—Ice is present during the winter period, and measurements are made to determine the winter flow. Relation of flow to gauge altogether disturbed during spring flood, while ice is present.

Accuracy—During flood stages the high velocity necessitates the taking of surface readings. The station rating curve is fairly well defined for ordinary flows.

Observer—James Bourne, Komoka.

Discharge Measurements of Thames River (Main Stream) at Kilworth for year ending September 30th 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 28.....	Roberts, E.....	206	248	1.63	6.71	404
December 12.....	"	211	391	3.19	7.42	1,258
1919						
January 24.....	"	241	1,110	5.32	10.50	5,906
February 14.....	"	221	279	2.49	6.98	694
May 29.....	"	206	320	2.96	7.21	947
September 15.....	"	184	152	.78	6.24	119

Daily Gauge Height in feet and Discharge in second-feet of Thames River (Main Stream) at Kilworth for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
1	6.50	225	6.75	475	6.92	655	7.12	875	7.12	875	9.12	3460	7.08	835	7.08	835	6.92	655	6.42	145	6.37	95	6.33	55
2	6.50	225	6.67	395	6.75	475	8.58	2680	6.92	655	9.04	3340	7.08	835	7.12	875	6.92	655	6.42	145	6.33	55	6.33	55
3	6.50	225	6.75	475	6.83	560	8.17	2140	6.92	655	8.29	2290	7.04	790	7.21	975	6.87	600	6.42	145	6.33	55	6.33	55
4	6.58	305	6.79	515	6.79	515	7.17	930	7.00	745	8.04	1970	7.00	745	8.92	3160	6.83	560	6.50	225	6.29	22	6.42	145
5	6.58	305	6.83	560	6.79	515	6.92	655	6.79	515	8.12	2070	7.04	790	12.79	11040	6.92	655	6.42	145	6.25	12	6.42	145
6	6.58	305	6.83	560	6.79	515	7.21	975	6.75	475	7.92	1830	7.29	1070	11.21	7310	7.00	745	6.42	145	6.25	12	6.33	55
7	6.54	265	6.79	515	6.71	435	7.42	1230	7.04	790	7.37	1170	7.96	1880	9.46	3990	6.96	700	6.42	145	6.25	12	6.33	55
8	6.46	185	6.75	475	6.83	560	7.17	830	6.79	515	7.33	1120	8.33	2340	8.62	2730	6.92	655	6.42	145	6.25	12	6.33	55
9	6.46	185	6.75	475	6.92	655	8.04	595	6.75	475	7.33	1120	8.33	2340	8.08	2020	6.83	560	6.33	55	6.25	12	6.33	55
10	6.50	225	6.83	560	7.33	1120	8.67	486	6.79	515	7.25	1020	9.75	4480	7.79	1670	6.83	560	6.33	55	6.25	12	6.33	55
11	6.50	225	7.04	790	7.25	1020	9.33	434	6.83	560	8.12	2070	11.62	8180	7.67	1530	6.83	560	6.33	55	6.25	12	6.25	12
12	6.46	185	7.00	745	7.33	1120	9.37	460	6.75	475	8.67	2800	10.25	5380	7.75	1620	6.75	475	6.33	55	6.25	12	6.25	12
13	6.46	185	6.92	655	7.46	1280	9.04	460	6.71	435	10.67	6180	9.25	3660	7.75	1620	6.71	435	6.33	55	6.25	12	6.25	12
14	6.46	185	6.83	560	10.79	6420	8.96	442	6.92	655	9.00	3280	8.58	2680	7.42	1230	6.62	345	6.33	55	6.29	22	6.25	12
15	6.42	145	6.75	475	12.21	9550	8.83	480	8.04	1970	8.37	3080	8.04	1970	7.25	1020	6.50	225	6.37	95	6.29	22	6.25	12
16	6.33	55	6.75	475	10.17	5230	8.67	460	7.37	1170	11.50	7920	9.08	3400	8.12	2070	6.50	225	6.42	145	6.33	55	6.25	12
17	6.46	185	6.75	475	9.17	3530	8.33	520	6.96	700	14.75	16860	10.29	5450	10.29	5450	6.58	305	6.37	95	6.42	145	6.25	12
18	6.46	185	6.75	475	8.46	2510	8.53	520	7.00	745	14.21	15130	10.08	5070	10.25	5380	6.58	305	6.33	55	6.42	145	6.25	12
19	6.42	145	6.79	515	7.87	1770	7.87	640	7.29	1070	11.50	7920	8.96	3220	9.12	3460	6.50	225	6.33	55	6.42	145	6.25	12
20	6.50	225	7.00	745	7.58	1420	7.42	625	6.75	475	10.21	5300	8.25	2240	8.62	2730	6.58	305	6.33	55	6.42	145	6.25	12
21	6.54	265	6.96	700	7.42	1230	7.17	830	6.79	515	9.79	4550	8.04	1970	9.71	4410	6.67	395	6.33	55	6.50	225	6.33	55
22	6.67	395	6.92	655	7.92	1830	7.17	830	6.87	600	9.21	3590	7.75	1620	9.58	4190	6.62	345	6.25	12	6.42	145	6.67	395
23	6.67	395	6.92	655	10.08	5070	7.50	1320	7.75	1620	8.54	2620	7.37	1170	9.46	3990	6.54	265	6.33	55	6.42	145	6.75	475
24	6.58	305	6.83	560	9.04	3340	10.42	5690	7.83	1720	8.12	2070	7.33	1120	9.25	3660	6.54	265	6.42	145	6.37	95	6.67	395
25	6.50	225	6.75	475	8.33	2340	9.25	3660	7.79	1670	8.04	1970	7.58	1420	8.75	2920	6.58	305	6.33	55	6.33	55	6.58	305
26	6.54	265	6.75	475	7.87	1770	8.87	3080	7.46	1280	8.00	1920	7.37	1170	8.12	2070	6.58	305	6.37	95	6.33	55	6.33	55
27	6.50	225	6.75	475	7.42	1230	8.25	2240	6.71	435	8.42	2460	7.25	1020	7.67	1530	6.58	305	6.33	55	6.42	145	6.33	55
28	6.54	265	6.71	435	7.25	1020	7.79	1670	7.29	1070	8.08	3280	7.21	975	7.37	1170	6.58	305	6.33	55	6.37	95	6.42	145
29	6.71	435	6.71	435	7.08	835	7.54	1370	.....	.....	9.00	2020	7.25	1020	7.08	835	6.50	225	6.25	12	6.33	55	6.33	55
30	6.83	560	6.75	475	7.08	835	7.37	1170	.....	.....	7.50	1320	7.17	930	7.00	745	6.46	185	6.29	22	6.33	55	6.42	145
31	6.75	475	.....	.....	7.04	790	7.29	1070	.....	.....	7.33	1120	.....	.....	7.00	745	.....	.....	6.37	95	6.33	55	.....	.....

NOTE.—Winter flow estimates (January 9th to 20th incl.), based on flow of north branch near Fanshawe.

Monthly Discharge of Thames River (Main Stream) at Kilworth for year
ending September 30th, 1919

Drainage Area, 1,270 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	560	55	255	.44	.04	.20	.23
November "	790	395	542	.62	.31	.43	.48
December "	9,550	435	1,939	7.52	.34	1.53	1.76
January (1919)	5,690	412	1,269	4.48	.32	1.00	1.15
February	1,970	435	835	1.55	.34	.66	.69
March	16,860	1,020	3,769	13.28	.80	2.97	3.42
April	8,180	745	2,353	6.44	.59	1.85	2.06
May	11,040	745	2,806	8.69	.59	2.21	2.55
June	745	185	422	.59	.15	.33	.37
July	225	12	91	.18	.01	.07	.08
August	225	12	69	.18	.01	.05	.06
September	475	12	106	.37	.01	.08	.09
The year	16,860	12	1,211	13.28	.01	.95	12.94

Thames River (North Branch) near Fanshawe

Location—At the highway bridge near Fanshawe Post Office, between lots 8 and 9, concession 4 and 5, Township of London, County of Middlesex.

Records Available—Daily gauge heights and discharge measurements from May 13, 1915.

Drainage Area—585 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment, downstream side. Elevation of zero of gauge 4.00 is referred to a B.M. (elevation 30.00) on tension rod, downstream side, 170 feet from the initial point of soundings.

Channel and Control—The channel is straight above and below section for 500 feet. The bed of the stream is composed of clay and gravel, the banks are high and will not overflow. The channel and control is shifting during high-water periods.

Discharge Measurements—Made from the bridge and at a permanent wading section about 500 feet above during low water.

Accuracy—This curve is fairly well defined.

Observer—R. C. Bradley, London.

Discharge Measurements of Thames River (North Branch) near Fanshawe
for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
December 1918						
December 12.....	Roberts, E.....	171	441	1.55	7.71	682
1919						
January 11.....	“	65	208	.93	6.60	192 (a)
“ 24.....	“	171	1,145	3.83	10.17	4,381 (a)
“ 24.....	“	171	1,077	3.33	9.79	3,584 (a)
February 14.....	“	171	434	.45	6.42	194 (a)
March 25.....	“	171	735	1.18	7.75	867
May 28.....	“	97	141	3.32	7.08	469
June 6.....	“	70	95	1.74	6.08	165
“ 6.....	“	71	114	2.12	6.46	242
July 24.....	“	55	34	1.73	5.64	58
August 2.....	“	26	17	1.51	5.25	26
September 15.....	Yeates, W.....	40	20	1.16	5.25	23

(a) Ice measurement.

Monthly Discharge of Thames River (North Branch) near Fanshawe for
year ending September 30th, 1919

Drainage Area, 585 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918).	36	23	28	.06	.04	.05	.06
November	246	29	64	.42	.05	.11	.12
December	6,870	49	1,079	11.74	.08	1.84	2.12
January (1919).	3,340	190	606	5.71	.32	1.04	1.20
February	1,530	100	362	2.62	.17	.62	.65
March	3,010	440	1,126	5.15	.75	1.92	2.21
April	4,780	260	1,214	8.17	.44	2.08	2.32
May	5,880	272	1,209	10.05	.46	2.07	2.39
June	221	33	113	.38	.06	.19	.21
July	59	11	26	.10	.02	.04	.05
August	65	13	28	.11	.02	.05	.06
September	98	2	26	.17	.003	.04	.04
The year	6,870	2	517	11.74	.003	.88	11.99

Thames River (South Branch) near Ealing

Location—At the highway bridge known as Vauxhall Bridge between lots 10 and 11, concession B, between Townships of London and Westminster, County of Middlesex.

Records Available—Daily gauge heights and discharge measurements from May 11, 1915.

Drainage Area—515 square miles.

Gauge—Vertical staff 0 to 12 feet on downstream side of first right pier. Elevation of zero of gauge is 4.00, referred to B.M., elevation 30.00.

Channel and Control—The channel is straight above and below for 800 feet. The banks and control are shifting under high-water conditions.

Discharge Measurements—Made from the bridge. During the extreme low water a wading section is used.

Winter Flow—The relation of gauge height to discharge is affected by ice during the winter months.

Accuracy—The rating curve is fairly well defined up to gauge height 11.00 feet.

Observer—Edna Leathorn, London.

Discharge Measurements of Thames River (South Branch) near Ealing for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
Nov. 28.....	Roberts, E.....	145	176	.75	6.21	132
Dec. 12.....	".....	159	280	1.33	6.85	372
1919						
Feb. 14.....	".....	164	229	1.07	6.56	245(a)
July 24.....	".....	66	76	1.01	5.92	78
Sept. 15.....	Yeates, W.....	63	63	.66	5.73	41

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Thames River (South Branch) near Ealing for year ending September 30th, 1919

Day	October			November			December			January			February			March			April			May			June			July			August			September		
	Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge		Gauge Ht.	Dis-charge	
	Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.	
1	6.08	110		6.42	195		6.33	172		6.96	324		6.73	412		8.67	1190		6.90	345		7.02	388		6.60	245		5.98	86		5.85	60		5.83	56	
2	6.13	122		6.33	162		6.40	190		8.17	1220		6.63	356		8.31	990		6.85	328		7.13	432		6.56	233		5.88	66		5.88	66		5.90	70	
3	6.17	132		6.29	162		6.46	205		8.04	820		6.67	324		7.73	685		6.77	300		7.10	420		6.58	239		5.96	82		5.90	70		5.85	60	
4	6.19	138		6.23	148		6.40	190		9.08	520		6.63	272		7.44	555		6.77	300		8.48	1080		6.50	215		5.98	86		5.77	44		5.81	52	
5	6.06	105		6.29	162		6.29	162		9.08	324		6.81	221		7.27	488		6.96	366		11.15	3220		6.48	210		5.94	78		5.94	78		5.83	56	
6	6.15	128		6.40	190		6.38	185		8.42	555		6.96	260		7.00	380		7.04	396		10.85	2900		6.44	200		5.98	86		5.81	52		5.83	56	
7	6.08	110		6.33	172		6.31	168		8.42	436		7.00	247		6.88	338		7.85	745		9.21	1530		6.42	195		6.00	90		5.81	52		5.75	40	
8	6.13	122		6.27	158		6.46	205		8.21	352		6.83	187		6.81	314		8.31	990		8.44	1060		6.35	178		5.94	100		5.79	48		5.71	32	
9	6.08	110		6.29	162		6.79	306		8.50	242		6.40	128		6.96	366		8.98	1350		7.92	780		6.35	178		5.94	78		5.79	48		5.81	52	
10	6.06	105		6.42	195		6.88	338		8.38	198		6.33	111		7.35	520		9.29	1580		7.67	655		6.31	168		5.92	74		5.77	44		5.81	52	
11	6.04	100		6.42	195		6.92	352		8.33	176		6.38	88		8.08	865		10.15	2260		7.75	695		6.25	152		5.90	70		5.71	32		5.83	56	
12	6.06	105		6.48	210		6.85	328		8.29	187		6.42	114		9.00	1390		9.58	1800		8.00	820		6.27	158		5.88	66		5.77	44		5.73	36	
13	6.04	100		6.46	205		6.90	345		8.17	187		6.33	118		9.75	1920		8.83	1280		7.79	715		6.27	158		5.88	66		5.81	52		5.77	44	
14	5.94	78		6.33	172		8.54	1120		8.08	167		6.52	194		8.27	970		8.25	960		7.48	570		6.25	152		5.81	52		5.79	48		5.79	48	
15	6.02	95		6.27	158		9.65	1850		8.08	194		7.06	1350		7.83	735		7.79	715		7.33	510		6.13	122		5.96	82		5.98	86		5.75	40	
16	5.92	74		6.23	148		9.29	1580		8.00	187		6.81	475		11.00	3050		9.25	1560		8.42	1050		6.04	100		5.92	74		5.92	74		5.83	56	
17	5.92	74		6.21	142		8.42	1050		8.00	210		6.63	436		12.73	5200		10.67	2720		10.17	2270		6.11	118		5.88	66		6.00	90		5.83	56	
18	6.04	100		6.25	152		7.83	735		8.19	210		6.60	359		12.25	4540		9.85	2000		10.42	2160		6.11	118		5.81	52		5.88	66		5.79	48	
19	6.02	95		6.44	200		7.46	565		8.25	260		6.46	242		10.54	2610		8.63	1170		9.00	1390		6.08	110		5.83	56		5.94	78		5.83	56	
20	6.10	115		6.54	227		7.19	456		8.25	253		6.50	187		9.13	1470		8.04	840		8.56	1110		6.83	320		5.75	40		5.96	82		5.85	60	
21	6.21	142		6.46	205		7.08	412		8.31	237		6.38	187		8.79	1260		7.88	760		9.29	1580		6.38	185		5.75	40		5.98	86		6.25	152	
22	6.35	178		6.38	185		7.52	590		8.38	220		8.25	453		8.02	830		7.29	496		9.17	1500		6.08	110		5.94	78		5.94	78		6.58	239	
23	6.29	162		6.38	185		8.67	1190		8.58	493		8.25	453		7.96	444		7.35	520		8.71	1210		6.13	122		5.88	66		5.83	56		6.21	142	
24	6.13	122		6.31	168		7.90	770		8.58	1390		7.96	444		7.83	735		7.35	520		8.23	945		6.13	122		5.83	56		5.77	44		6.08	110	
25	6.13	122		6.21	142		7.54	600		8.71	1190		7.71	675		7.17	448		7.35	520		7.88	760		6.08	110		5.83	56		5.88	66		6.04	100	
26	6.13	122		6.21	142		7.54	600		7.81	1190		7.54	419		7.17	448		7.04	396		7.63	640		6.17	132		5.75	40		5.88	66		5.96	82	
27	6.08	110		6.17	132		7.29	496		6.67	925		7.96	359		8.23	945		7.04	396		7.17	448		6.04	100		5.77	44		5.88	66		5.96	82	
28	6.17	132		6.19	138		7.13	434		7.33	730		7.96	359		7.79	715		7.21	464		7.04	396		6.06	105		5.83	56		5.92	74		5.85	60	
29	6.67	266		6.35	178		7.06	404		7.08	570		.....	.....		7.79	715		7.21	464		7.04	396		6.06	105		5.83	56		5.92	74		5.85	60	
30	6.71	278		6.50	215		7.88	760		7.04	431		.....	.....		7.35	520		7.04	396		6.96	366		5.88	66		5.83	56		5.88	66		6.04	100	
31	6.52	221		.....	.....		8.42	1050		6.98	398		.....	.....		7.15	440		.....	.....		6.79	308		.....	.....		5.85	60		5.85	60		.....	.....

NOTE.—Winter flow estimates (January and February), based on flow of north branch near Fanshawe.

Monthly Discharge of Thames River (South Branch) near Ealing for
year ending September 30th, 1919,

Drainage Area, 515 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October... (1918)	278	74	128	.54	.14	.25	.29
November ..	227	132	174	.44	.26	.34	.38
December ..	1,850	162	586	3.59	.31	1.14	1.31
January .. (1919)	2,940	167	534	5.71	.32	1.04	1.20
February	1,350	88	318	2.62	.17	.62	.65
March	5,200	314	1,205	10.09	.61	2.34	2.70
April	2,720	300	900	5.28	.58	1.75	1.95
May	3,220	308	1,079	6.25	.60	2.10	2.42
June	320	66	159	.62	.13	.31	.35
July	100	40	67	.19	.08	.13	.15
August	90	32	63	.17	.06	.12	.14
September	239	32	77	.46	.06	.15	.17
The year	5,200	32	443	10.09	.06	.86	11.67

Regular Stations

SOUTH-WESTERN ONTARIO DISTRICT

Grand River and Tributaries

River	Location	Drain- age Area Sq. Miles	Township	County
Grand	at Belwood	280	West Garafraxa	Wellington
"	at Brantford	2,000	Brantford	Brant
"	near Conestogo	550	Woolwich	Waterloo
"	at Galt	1,360	North Dumfries	"
"	at Glen Morris	1,390	South Dumfries	Brant
"	at York	2,280	Oneida	Haldimand
Speed	at Hespeler	250	Waterloo	Waterloo

Grand River at Belwood

Location—At the bridge in the Village of Belwood, on the 7th concession, Township of West Garafraxa, County of Wellington.

Records Available—From August 31, 1913.

Drainage Area—280 square miles.

Gauge—Vertical steel staff 0 to 12 feet on right abutment. Elevation of zero of gauge is 1366.00, which has remained unchanged since established.

Channel and Control—The channel is straight for about 400 feet above and 600 feet below gauging section. The channel bed at the bridge is solid rock, and permanent at all stages. At the permanent low water section, however, the channel is shifting under high water conditions.

Winter Flow—During the winter months the relation of gauge height to discharge is greatly affected by ice, and readings are taken to determine the winter discharge.

Accuracy—The river stage at this section is not affected by any power plants above or below. The rating curve is well defined, and estimates are considered good.

Observer—H. Hutchinson, Belwood P.O.

Discharge Measurements of Grand River at Belwood for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 23.....	Roberts, E.....	76	77	2.10	1367.62	162
1919						
February 18.....	"	70	47	1.59	1367.83	74 (a)
March 26.....	"	110	690	2.80	1370.15	1,930
May 25.....	"	110	522	1.27	1368.60	663
September 17.....	"	20	6	.80	1366.83	4.8

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Grand River at Belwood for year ending September, 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1367.19	53	1367.62	187	1367.69	212	1367.72	222	1368.14	264	1368.21	218	1368.13	385	1367.69	212	1367.28	75	1366.99	19	1366.83	6	1366.83	6
2	1367.17	49	1367.52	152	1368.16	400	1367.87	274	1368.04	229	1368.34	264	1367.84	264	1367.79	246	1367.24	65	1366.97	17	1366.83	6	1366.83	6
3	1367.15	45	1367.47	134	1367.96	309	1367.88	278	1367.95	198	1368.28	243	1367.80	250	1368.10	370	1367.22	60	1366.94	14	1366.83	6	1366.83	6
4	1367.10	35	1367.73	226	1367.88	278	1368.36	420	1367.92	187	1369.46	965	1367.88	278	1369.31	540	1367.12	39	1366.92	12	1366.83	6	1366.83	6
5	1367.10	35	1368.04	343	1367.83	260	1368.46	510	1367.89	176	1369.46	965	1367.88	278	1369.31	540	1367.12	39	1366.92	12	1366.83	6	1366.83	6
6	1367.10	35	1368.04	343	1367.83	260	1368.46	510	1367.89	176	1369.46	965	1367.88	278	1369.31	540	1367.12	39	1366.92	12	1366.83	6	1366.83	6
7	1367.19	53	1367.79	246	1367.81	254	1368.55	570	1367.85	162	1369.46	965	1368.40	555	1368.94	945	1367.71	218	1366.99	19	1366.83	6	1366.82	6
8	1367.77	240	1367.62	187	1367.77	240	1368.39	470	1367.80	145	1369.33	860	1368.63	700	1368.41	540	1367.50	145	1366.98	18	1366.83	6	1366.81	6
9	1367.79	246	1367.75	232	1367.81	254	1368.30	470	1367.77	134	1369.05	640	1368.67	730	1368.09	366	1367.42	117	1366.93	13	1366.82	6	1366.81	6
10	1367.60	180	1368.37	515	1367.94	301	1368.21	375	1367.72	60	1369.09	670	1369.34	1220	1367.87	274	1367.37	101	1366.92	12	1366.79	4	1366.81	6
11	1367.45	128	1368.55	640	1368.01	330	1368.17	356	1367.69	53	1369.02	620	1369.69	1700	1367.80	250	1367.29	78	1366.92	12	1366.78	4	1366.81	6
12	1367.35	95	1368.22	432	1368.00	325	1368.00	250	1367.64	43	1368.95	570	1370.46	2800	1368.27	458	1367.25	68	1366.90	10	1366.77	4	1366.83	6
13	1367.25	68	1367.90	285	1367.96	309	1367.84	194	1367.62	39	1368.85	505	1369.42	1400	1368.69	745	1367.20	55	1366.89	10	1366.77	4	1366.85	8
14	1367.22	60	1367.75	232	1367.93	297	1367.86	180	1367.60	35	1368.84	499	1368.96	965	1368.38	525	1367.14	43	1366.89	10	1366.77	4	1366.85	8
15	1367.23	62	1367.56	166	1369.91	1990	1367.79	176	1367.77	72	1368.65	395	1368.26	453	1367.77	218	1367.20	55	1366.86	8	1366.78	4	1366.83	6
16	1367.25	68	1367.46	132	1369.54	1530	1367.80	180	1367.84	92	1368.78	464	1369.21	1080	1367.71	218	1367.20	55	1366.86	8	1366.79	4	1366.83	6
17	1367.17	49	1367.51	148	1368.69	745	1367.79	176	1367.81	83	1371.12	4060	1370.05	2170	1367.96	309	1367.13	41	1366.85	8	1366.82	6	1366.83	6
18	1367.14	43	1368.11	375	1368.37	499	1367.80	180	1367.79	78	.....	.....	1369.30	1280	1368.08	361	1367.08	32	1366.83	6	1367.02	23	1366.83	6
19	1367.33	89	1368.11	375	1368.07	456	1367.81	184	1367.73	62	.....	.....	1368.59	670	1367.82	257	1367.03	24	1366.83	6	1367.02	23	1366.83	6
20	1368.02	334	1367.90	285	1368.02	324	1367.81	180	1367.64	43	.....	.....	1368.32	487	1367.96	309	1367.00	20	1366.83	6	1367.02	23	1366.83	6
21	1368.02	334	1367.90	285	1368.02	324	1367.81	180	1367.64	43	.....	.....	1368.21	330	1369.73	1750	1367.00	20	1366.83	6	1367.02	23	1366.83	6
22	1367.81	254	1367.78	243	1369.81	1860	1367.81	180	1367.62	39	.....	.....	1367.76	236	1368.78	820	1367.00	20	1366.83	6	1367.02	23	1366.83	6
23	1367.61	184	1367.58	173	1370.21	2390	1368.01	254	1367.58	32	.....	.....	1367.61	264	1369.08	1070	1366.99	19	1366.83	6	1367.02	23	1366.83	6
24	1367.43	117	1367.27	72	1368.02	334	1368.46	405	1367.63	41	.....	.....	1367.61	184	1368.54	635	1366.99	19	1366.83	6	1367.02	23	1366.83	6
25	1367.42	117	1367.27	72	1368.02	334	1368.46	405	1367.63	41	.....	.....	1367.61	184	1368.54	635	1366.99	19	1366.83	6	1367.02	23	1366.83	6
26	1367.35	95	1367.25	68	1367.92	293	1368.59	530	1367.64	43	.....	.....	1367.61	184	1368.54	635	1366.99	19	1366.83	6	1367.02	23	1366.83	6
27	1367.33	89	1367.42	117	1368.06	352	1368.51	425	1367.66	47	1371.01	3830	1367.76	236	1367.95	305	1367.03	24	1366.89	10	1366.87	8	1366.87	8
28	1367.59	176	1367.46	131	1368.02	334	1368.48	410	1367.67	49	1369.19	1170	1367.93	297	1367.71	218	1367.03	24	1366.89	10	1366.87	8	1366.86	8
29	1368.33	493	1367.84	264	1367.87	274	1368.42	380	.....	.....	1368.84	865	1368.09	566	1367.58	173	1367.01	22	1366.83	6	1366.84	7	1366.85	8
30	1368.04	343	1367.76	236	1367.79	246	1368.32	334	.....	.....	1368.46	575	1367.83	260	1367.47	134	1367.00	20	1366.83	6	1366.84	7	1366.87	8
31	1367.79	246	.....	.....	1367.60	180	1368.24	301	.....	.....	1368.05	348	.....	.....	1367.34	92	.....	.....	1366.83	6	1366.83	6	.....	.....

Monthly Discharge of Grand River at Belwood for year ending September 30th, 1919

Drainage Area, 280 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	493	35	134	1.76	.12	.48	.55
November "	640	68	235	2.29	.24	.84	.94
December "	2,390	180	607	8.53	.64	2.17	2.50
January (1919)	570	176	311	2.04	.63	1.11	1.28
February	264	32	92	.94	.11	.33	.34
March	4,060	218	954	14.50	.78	3.41	3.93
April	2,800	162	701	10.00	.58	2.50	2.79
May	2,540	92	573	9.07	.32	2.05	2.36
June	218	19	63	.78	.07	.22	.24
July	19	6	10	.07	.02	.04	.05
August	23	4	9	.08	.01	.03	.04
September	23	6	9	.08	.02	.03	.03
The year	4,060	4	311	14.50	.01	1.11	15.07

Grand River at Brantford

Location—At the Toronto-Hamilton-Buffalo Railway bridge in the City of Brantford, County of Brant.

Records Available—Discharge measurements from August, 1912. Daily gauge heights from July 8, 1913.

Drainage Area—2,000 square miles.

Gauge—Vertical steel staff, 0 to 12 feet on left abutment. Elevation of zero of gauge is 643.00, which has remained unchanged since established.

Channel and Control—The flow is confined between the abutments of the bridge at all stages. The bed and left bank is shifting under high water conditions.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice, and measurements are made to determine the winter flow.

Regulation—During the low water stage serious fluctuations are noticeable at this location. The observed mean gauge height does not always give the correct mean daily stage.

Accuracy—A slight angle at section, which changes with changes in stage, affects these records.

Observer—John Anguish, Brantford.

Discharge Measurements of Grand River at Brantford for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 27.....	Roberts, E.....	281	1,041	.83	645.00	867
1919						
January 13.....	"	93	622	1.24	645.42	769(a)
February 15.....	"	281	1,016	.92	645.00	967(a)
March 10.....	"	281	1,216	1.50	645.71	1,830
April 15.....	"	281	1,482	2.34	646.64	3,461
June 5.....	"	278	982	.95	644.87	932
" 6.....	"	278	1,010	1.00	645.00	1,002
" 7.....	"	281	1,208	1.56	645.71	1,895
July 25.....	"	228	759	.39	643.98	297
August 30.....	Yeates, W.....	293	881	.56	644.48	470
September 2.....	"	225	777	.41	644.10	320

(a) Ice measurement.

Monthly Discharge of Grand River at Brantford for year ending
September 30th, 1919

Drainage Area, 2,000 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October ..(1918).	2,400	560	857	1.20	.28	.43	.50
November "	2,500	820	1,266	1.25	.41	.63	.70
December "	15,180	890	3,168	7.59	.44	1.58	1.82
January (1919).	1,760	484	982	.88	.24	.49	.56
February	970	365	657	.48	.18	.33	.34
March	37,360	1,260	6,612	18.68	.63	3.31	3.82
April.....	13,330	1,400	3,698	6.66	.70	1.85	2.06
May.....	13,840	1,210	3,898	6.92	.60	1.95	2.25
June	2,100	442	819	1.05	.22	.41	.46
July	515	205	373	.26	.10	.19	.22
August	560	185	352	.28	.09	.18	.21
September	835	165	394	.42	.08	.20	.22
The year.....	37,360	165	1,938	18.68	.08	.97	13.15

Grand River near Conestogo

Location—At the highway bridge $\frac{1}{4}$ mile below the Village of Conestogo, Township of Woolwich, County of Waterloo.

Records Available—From July 16, 1913.

Drainage Area—550 square miles.

Gauge—Vertical steel staff 0 to 12 feet on the centre pier of bridge. Elevation of zero is 1017.00 feet.

Channel and Control—The channel is straight for about 300 feet above and below the gauging section. The banks are low and liable to overflow. The bed is composed of gravel, and all the water is confined between the abutments of the bridge, except at a very serious flood. In flood stages the banks and bed are liable to shift slightly.

Discharge Measurements—Made from the bridge during high water, and at a permanent low water section located 600 feet upstream during the low water period.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice during the winter season, and measurements are made to determine the winter flow.

Accuracy—The slight shifting of the channel has little effect. The rating curve is well defined, and records are good.

Observer—Geo. Schinbein, Conestogo.

Discharge Measurements of Grand River near Conestogo for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
Feb. 18.....	Roberts, E.....	130	100	1.30	1018.79	130(a)
May. 26.....	".....	148	374	2.50	1019.67	934
Sept. 17.....	".....	120	77	.45	1017.83	34

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Grand River near Conestogo for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	1018.27	94	1018.87	298	1018.52	166	1018.89	226	1019.21	274	1019.92	695	1019.21	477	1019.09	369	1018.33	109	1017.83	33	1017.81	31	1017.67	17
2	1018.27	94	1018.71	234	1018.48	154	1019.12	320	1018.94	172	1019.69	535	1019.08	400	1019.04	380	1018.31	103	1017.81	31	1017.67	17	1017.67	17
3	1018.27	94	1018.52	166	1018.60	190	1019.12	320	1018.92	166	1019.77	590	1019.07	370	1019.25	505	1018.23	86	1017.85	35	1017.58	8	1017.92	42
4	1018.27	94	1018.75	250	1018.50	160	1019.00	270	1018.96	178	1020.04	795	1018.92	320	1022.25	3740	1018.19	78	1017.94	44	1017.60	10	1017.64	14
5	1018.19	78	1019.12	422	1018.44	142	1018.83	202	1018.96	178	1020.75	1470	1018.96	340	1022.08	8510	1018.94	330	1017.87	37	1017.64	14	1017.73	23
6	1018.27	94	1019.02	370	1018.39	127	1019.14	330	1018.81	133	1020.33	1060	1019.14	535	1020.62	1760	1020.08	1200	1017.79	29	1017.60	10	1017.62	12
7	1018.35	115	1018.81	270	1018.48	154	1020.96	1920	1018.83	139	1020.08	830	1019.92	1050	1019.21	434	1018.58	184	1017.83	33	1017.56	6	1017.62	12
8	1018.85	290	1018.73	242	1018.54	172	1020.83	1770	1018.83	139	1019.79	605	1020.04	1160	1019.50	680	1018.71	234	1017.89	39	1017.60	10	1017.77	27
9	1018.77	258	1019.21	477	1018.83	282	1020.62	1540	1018.69	98	1019.33	325	1020.60	1740	1019.14	434	1018.58	184	1017.73	29	1017.69	19	1017.83	33
10	1018.54	172	1020.06	1180	1018.98	350	1020.42	1340	1018.62	84	1019.27	520	1021.50	2770	1019.08	400	1018.50	160	1017.62	12	1017.58	8	1017.67	17
11	1018.44	142	1019.54	710	1019.10	410	1020.39	1310	1018.62	84	1019.12	422	1022.67	4330	1019.42	625	1018.37	121	1017.77	27	1017.60	10	1017.64	14
12	1018.31	103	1019.19	464	1018.94	330	1020.25	1170	1018.75	115	1019.25	505	1021.25	2470	1020.00	1120	1018.35	115	1017.87	37	1017.56	6	1017.67	17
13	1018.21	82	1018.96	340	1019.04	380	1020.12	1050	1018.73	109	1019.42	625	1020.50	1630	1019.71	860	1018.31	103	1017.83	33	1017.60	10	1017.89	39
14	1018.25	90	1018.79	266	1020.33	1450	1019.98	915	1018.79	127	1019.71	860	1020.08	1200	1019.33	560	1018.37	121	1017.81	31	1017.81	31	1017.67	17
15	1018.23	86	1018.73	242	1022.33	1450	1019.89	840	1019.00	190	1019.25	505	1019.69	840	1019.00	360	1018.37	121	1017.89	39	1017.71	21	1017.64	14
16	1018.27	94	1018.67	218	1021.50	2770	1019.79	750	1019.14	246	1020.75	1900	1020.64	1780	1018.89	306	1018.10	82	1017.87	37	1017.92	42	1017.81	31
17	1018.31	103	1018.54	172	1020.87	2040	1019.71	690	1018.94	172	1024.33	6960	1022.00	3410	1019.25	505	1018.10	60	1017.73	23	1017.81	31	1017.83	33
18	1018.23	86	1018.58	184	1020.37	1490	1019.58	595	1018.87	151	1026.50	10430	1020.96	2140	1019.46	650	1018.12	64	1017.64	14	1017.92	42	1017.73	23
19	1018.23	86	1018.94	330	1019.89	1020	1019.33	428	1018.73	121	1022.17	3630	1020.19	1310	1019.17	452	1018.08	58	1017.64	14	1018.06	56	1017.58	8
20	1018.25	90	1019.31	545	1019.46	650	1019.31	416	1018.83	139	1022.46	4030	1019.71	860	1019.06	390	1018.06	56	1017.60	10	1018.14	68	1017.58	29
21	1019.04	380	1019.08	400	1019.35	575	1019.25	385	1018.75	115	1022.96	4770	1019.54	710	1019.94	1070	1018.06	56	1017.85	35	1018.00	50	1018.14	68
22	1019.19	464	1018.92	320	1021.27	2490	1019.14	330	1018.75	115	1021.29	2520	1019.31	545	1021.62	2920	1017.83	33	1018.00	50	1018.02	52	1018.12	64
23	1018.77	298	1018.75	250	1022.46	4030	1019.50	540	1018.73	109	1021.17	2370	1019.21	477	1021.25	2470	1017.89	39	1017.87	37	1017.98	48	1018.17	74
24	1018.67	218	1018.42	136	1020.85	2020	1020.12	960	1018.79	127	1021.33	2570	1019.15	440	1020.87	2040	1017.85	35	1017.73	23	1017.89	39	1018.12	64
25	1018.48	154	1018.35	115	1019.62	780	1020.10	940	1018.75	115	1021.39	2640	1019.06	390	1020.12	1240	1018.02	56	1017.58	8	1017.81	31	1017.94	44
26	1018.50	160	1018.39	127	1019.17	452	1020.06	905	1018.75	109	1021.79	3140	1018.87	298	1019.58	745	1018.06	56	1017.60	10	1018.02	52	1017.94	44
27	1018.37	121	1018.42	136	1019.19	464	1019.98	830	1018.69	98	1022.54	4150	1018.79	266	1019.17	452	1018.00	50	1017.56	6	1018.06	56	1017.81	31
28	1018.69	226	1018.37	121	1019.33	560	1019.75	645	1018.81	133	1021.47	2370	1019.04	380	1018.87	298	1017.94	44	1017.62	12	1017.87	37	1017.73	23
29	1019.83	965	1018.58	184	1019.19	464	1019.62	484	.....	.....	1020.42	1540	1019.33	560	1018.71	234	1017.83	33	1017.58	33	1017.77	27	1017.67	17
30	1019.50	680	1019.00	360	1019.14	434	1019.35	335	.....	.....	1019.87	1000	1019.12	422	1018.60	190	1017.83	33	1017.60	10	1017.75	25	1017.73	23
31	1018.81	274	.....	.....	1018.94	330	1019.25	290	.....	.....	1019.67	825	.....	.....	1018.50	160	.....	.....	1017.58	8	1017.67	17	.....	.....

Monthly Discharge of Grand River near Conestogo for year ending
September 30th, 1919

Drainage Area, 550 Square Miles.

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
October (1918)	965	78	300	1.75	.14	.54	.62
November "	1,180	115	318	2.15	.21	.58	.65
December.. "	2,770	127	854	5.04	.23	1.55	1.79
January. . (1919)	1,920	202	743	3.49	.37	1.35	1.56
February	274	84	141	.50	.15	.26	.27
March.....	10,430	325	2,103	18.96	.59	3.82	4.40
April.....	4,330	266	1,121	7.87	.48	2.04	2.28
May.....	3,740	160	983	6.80	.29	1.79	2.06
June.	1,200	33	142	2.18	.06	.26	.29
July.....	50	6	25	.09	.01	.05	.06
August.....	68	6	29	.12	.01	.05	.06
September	74	8	30	.13	.01	.05	.06
The year	10,430	6	571	18.96	.01	1.04	14.12

Grand River at Galt

Location—At the Concession Street bridge, in the City of Galt, Township of North Dumfries, County of Waterloo.

Records Available—From July 21, 1913.

Drainage Area—1,360 square miles.

Gauge—Vertical steel staff 0 to 12 feet on first left pier of the bridge. Elevation of zero of gauge is 851.00, which has remained unchanged since established.

Channel and Control—The channel is straight for 1,000 feet above and below the section. The bed is solid rock formation. Residents each year encroach on the natural channel by building up the banks.

Discharge Measurements—Made from bridge for high stages, and at a permanent wading section 150 feet upstream during low stages.

Winter Flow—Ice slightly affects the relation of gauge height to discharge during the winter, and measurements are made to determine the winter flow.

Regulation—This section is subject to serious fluctuations in the river stage caused by the operation of the Galt dam situated $\frac{1}{4}$ mile above.

Accuracy—The rating curve is fairly well defined, and records are good.

Observer—Charles Parker, Galt.

Discharge Measurements of Grand River at Galt for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
January 14.....	Roberts, E.....	180	620	.87	852.85	536 (a)
February 16.....	"	180	673	.71	852.81	476 (a)
May 26.....	"	193	1,024	1.91	854.58	1,962
September 17.....	"	135	170	.58	851.71	98

(a) Ice measurement.

Monthly Discharge of Grand River at Galt for year ending
September 30th, 1919

Drainage Area, 1,360 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	1,450	238	485	1.07	.17	.36	.41
November “	1,530	330	683	1.12	.24	.50	.56
December “	10,600	413	1,925	7.79	.30	1.42	1.64
January (1919)	2,040	413	708	1.50	.30	.52	.60
February	695	286	431	.51	.21	.32	.33
March.....	30,090	845	4,995	22.12	.62	3.67	4.23
April.....	9,780	685	2,294	7.19	.50	1.69	1.89
May	9,040	580	2,244	6.65	.43	1.65	1.90
June	1,360	161	374	1.00	.12	.27	.30
July.....	182	56	114	.13	.04	.08	.09
August.....	203	61	120	.15	.04	.09	.10
September.....	301	74	140	.22	.05	.10	.11
The year.....	30,090	56	1,219	22.12	.04	.90	12.16

Grand River at Glen Morris

Location—At the Glen Morris bridge, in the Village of Glen Morris, Township of South Dumfries, County of Brant.

Records Available—Discharge measurements from August, 1912. Daily gauge heights from July 21, 1913.

Drainage Area—1,390 square miles.

Gauge—Vertical steel staff 0 to 12 feet on the second pier from the left bank. Elevation of the zero of gauge is 801.00, which has remained unchanged since established.

Channel and Control—The channel is straight for 1,000 feet above and below the section. The bed of the river is composed of gravel and boulders, and banks are permanent. The bed and control is shifting under high water conditions.

Discharge Measurements—Made from bridge during the high water stages, and at permanent wading section located 150 feet upstream during the lower water periods.

Winter Flow—This section is seriously affected by ice which usually floods, forming as many as three or four layers of ice with water between them. Measurements are made during the winter months to determine the winter flow.

Regulation—This section is subject to fluctuations in the river stage, due to the storing of water, during the night and at week ends, by the Galt dam, located eight miles above.

Accuracy—Owing to poor natural conditions, the liability of the control to shift and back water caused by ice, the records cannot be considered better than fair.

Observer—Alfred Forbes, Glen Morris P.O.

Discharge Measurements of Grand River at Glen Morris for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
January 13.....	Roberts, E.	271	539	1.32	803.00	714 (a)
February 16.....	"	271	483	1.14	802.79	496 (a)
May 26.....	"	278	815	2.97	804.00	2,422
September 17.....	"	155	142	.82	802.21	117

(a) Ice measurement.

Monthly Discharge of Grand River at Glen Morris for year ending
September 30th, 1919

Drainage Area, 1,390 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October (1918)	1,840	230	505	1.32	.17	.36	.42
November "	1,840	356	886	1.32	.26	.64	.71
December "	11,470	461	2,139	8.25	.33	1.54	1.78
January .. (1919)	1,350	279	620	.97	.20	.45	.52
February	615	185	367	.44	.13	.26	.27
March	34,170	1,050	5,471	24.58	.76	3.94	4.54
April	10,740	910	2,667	7.73	.65	1.92	2.14
May	9,680	635	2,439	6.96	.46	1.75	2.02
June	1,700	190	445	1.22	.14	.32	.36
July	230	104	157	.17	.07	.11	.13
August	230	104	158	.17	.07	.11	.13
September	500	104	173	.36	.07	.12	.13
The year	34,170	104	1,347	24.58	.07	.97	13.17

Grand River at York

Location—At the highway bridge in the Village of York, Township of Oneida, County of Haldimand.

Records Available—From June 25, 1913.

Drainage Area—2,280 square miles.

Gauge—Vertical steel staff 0 to 6 feet on the first pier from left abutment and 6 to 12 feet on the left abutment. The elevation of zero is 593.00, and has remained unchanged since established.

Channel and Control—The flow is confined between the abutments of the bridge at all stages. The bed of the river is well protected, but shifting during flood stages. A partly demolished dam about 200 feet downstream affects flow, especially at low stages. Part of this old dam is washed out at each flood period.

Discharge Measurements—Taken from the highway bridge, and at a permanent low water section located 800 feet above during the low water period.

Floods—No floods of a serious nature have occurred here since the spring of 1912, when the dam below the bridge was wrecked, the water cutting around the right abutment, greatly increasing the width of the channel. Village residents state the water rose to a gauge height of 606 feet, which would mean approximately 100,000 second feet.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice, and measurements are made to determine the winter flow.

Regulation—The nearest dam is at Caledonia, five miles above. The intermittent operation of the mills causes daily fluctuations in the gauge heights.

Accuracy—The conditions of flow are good, except for the fluctuations caused through the Caledonia Mills. Well-defined rating curves have been established, and the records can be considered good. Semi-daily gauge heights will not give a good representative mean.

Observer—Harry Brown, York P.O.

Discharge Measurements of Grand River at York for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1919						
May. 27.....	Roberts, E.....	352	1,662	1.83	595.33	3,048
Sept. 16.....	".....	339	949	.45	593.25	423

Monthly Discharge of Grand River at York for year ending
September 30th, 1919

Drainage Area, 2,280 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October . (1918)	2,310	525	883	1.01	.23	.39	.45
November "	2,440	780	1,301	1.07	.34	.57	.64
December "	11,590	840	2,890	5.08	.37	1.27	1.46
January (1919)	4,170	1,400	2,318	1.83	.61	1.08	1.18
February	3,000	550	1,084	1.32	.24	.48	.50
March	36,240	1,030	6,787	15.89	.45	2.98	3.44
April	9,940	1,220	3,339	4.36	.54	1.46	1.63
May	12,020	1,480	4,765	5.27	.65	2.09	2.41
June	2,310	455	864	1.01	.20	.38	.42
July	590	391	461	.26	.17	.20	.23
August	475	332	401	.21	.15	.18	.21
September	465	324	387	.20	.14	.17	.19
The year	36,240	324	2,139	15.89	.14	.94	12.76

Speed River at Hespeler

Location—At a point 100 feet below the jail, which adjoins the power house, in the Town of Hespeler, Township of Waterloo, County of Waterloo.

Records Available—Discharge measurements from July 10, 1913. Daily gauge heights from October 23, 1913.

Drainage Area—250 square miles.

Gauge—Vertical steel staff 0 to 12 feet on jail wall adjoining power house. The elevation of zero of the gauge is 935.00.

Channel and Control—Straight for about 300 feet above and below the gauging section. Loose gravel forms the bed of this stream, which is decidedly shifting. The banks are low, and overflow when the water rises 2 feet above normal. Weeds at the control and in channel have a decided effect at the gauging section.

Discharge Measurements—Made from a permanent wading section 100 feet below the gauge during the low stages, and the dam 400 feet above will be used as a weir during the flood season.

Winter Flow—The relation of gauge height to discharge is somewhat affected by the presence of ice for a short period during the winter season.

Regulation—A dam 400 ft. above this section causes serious fluctuations in the river stage during the low water period.

Accuracy—Owing to the shifting bed and the presence of weeds at and below section, greatly interfering with the metering of stream, these records can only be classed as fair.

Observer—W. D. Scott, Hespeler.

Discharge Measurements of Speed River at Hespeler for year ending September 30th, 1919

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet
1918						
November 23.....	Roberts, E....	96	86	1.27	936.42	110(a)
1919						
January 14.....	"	92	101	1.33	936.44	134
February 15.....	"	94	102	1.36	936.46	138
May 26.....	"	101	189	2.55	937.35	480
September 17.....	"	93	82	.97	936.42	79

(a) Ice measurement.

Daily Gauge Height in feet and Discharge in second-feet of Speed River at Hespeler for year ending September 30th, 1919

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.
1	936.50	138	936.56	154	936.37	113	936.60	164	936.52	143	936.50	138	937.00	310	936.87	255	936.48	134	936.19	87	936.12	79	936.23	92
2	936.50	138	936.56	154	936.67	134	936.67	185	936.37	113	936.77	218	936.73	204	936.96	263	936.42	122	936.19	87	936.12	79	936.29	99
3	936.50	138	936.56	154	936.67	134	936.67	185	936.37	113	936.77	218	936.73	204	936.96	263	936.42	122	936.19	87	936.12	79	936.29	99
4	936.46	130	936.56	154	936.52	143	936.81	232	936.39	116	936.94	284	936.73	204	937.42	525	936.50	138	936.21	87	936.06	70	936.27	96
5	936.46	126	936.56	159	936.48	134	936.77	218	936.35	109	937.56	600	936.73	204	938.46	1180	936.48	134	936.17	85	936.29	99	936.25	94
6	936.17	85	936.52	170	936.44	126	936.69	191	936.35	109	937.25	433	936.83	240	938.02	885	936.44	126	936.14	81	936.25	94	936.25	94
7	936.42	122	936.58	159	936.42	122	936.69	191	936.29	99	937.25	433	936.83	240	938.02	885	936.44	126	936.14	81	936.25	94	936.25	94
8	936.33	105	936.58	159	936.37	113	936.52	143	936.29	99	937.25	433	936.83	240	938.02	885	936.44	126	936.14	81	936.25	94	936.25	94
9	936.29	99	936.50	138	936.44	126	936.46	130	936.27	96	936.81	232	937.27	443	936.98	301	936.44	126	936.14	81	936.25	94	936.25	94
10	936.29	99	936.33	105	936.44	126	936.54	148	936.27	96	936.79	225	937.64	650	936.96	293	936.44	126	936.14	81	936.25	94	936.25	94
11	936.27	96	936.46	130	936.52	143	936.52	143	936.35	109	936.81	232	937.64	650	936.96	293	936.44	126	936.14	81	936.25	94	936.25	94
12	936.27	96	936.48	134	936.58	159	936.57	156	936.31	102	936.81	232	937.64	650	936.96	293	936.44	126	936.14	81	936.25	94	936.25	94
13	936.14	81	936.48	134	936.62	170	936.42	122	936.35	109	937.23	423	937.60	625	937.67	665	936.31	102	936.06	73	936.27	96	936.21	89
14	936.27	96	936.50	138	937.29	453	936.39	116	936.39	116	937.23	423	937.60	625	937.67	665	936.31	102	936.06	73	936.27	96	936.21	89
15	936.29	99	936.44	126	937.83	765	936.35	109	936.35	109	936.94	284	937.21	413	937.42	545	936.35	109	936.06	68	936.25	94	936.14	81
16	936.29	99	936.46	130	937.67	665	936.35	109	936.33	105	936.38	1110	937.48	555	937.00	310	936.23	92	935.94	64	936.29	99	936.29	99
17	936.35	109	936.46	130	937.21	413	936.35	109	936.42	122	940.10	2400	938.42	1150	937.00	310	936.23	92	935.94	64	936.29	99	936.29	99
18	936.35	109	936.52	143	937.92	276	936.39	116	936.35	109	941.96	3790	937.42	820	937.23	423	936.25	94	936.08	75	936.31	102	936.31	102
19	936.39	116	936.48	134	936.94	284	936.39	116	936.42	122	939.94	2280	937.62	635	937.12	368	936.29	99	936.10	77	936.46	130	936.29	99
20	936.25	94	936.52	143	936.74	208	936.44	126	936.42	122	939.08	1630	937.58	615	937.08	348	936.27	96	936.17	87	936.35	113	936.27	96
21	936.31	102	936.52	143	936.74	208	936.39	116	936.42	122	938.79	1410	937.21	413	937.29	453	936.29	99	936.19	87	936.35	113	936.27	96
22	936.35	109	936.52	143	937.04	329	936.42	122	936.37	113	938.02	885	936.81	232	938.08	920	936.25	94	936.23	92	936.33	105	936.31	102
23	936.35	109	936.46	130	937.48	555	936.52	143	936.42	122	937.96	845	936.79	225	938.37	1110	936.27	96	936.21	89	936.33	105	936.31	102
24	936.33	105	936.31	102	937.71	690	936.89	263	936.42	122	937.92	820	936.79	225	938.14	960	936.27	96	936.21	89	936.33	105	936.31	102
25	936.35	109	936.42	122	937.52	580	936.83	240	936.42	122	937.85	775	936.77	218	937.77	725	936.29	99	936.23	92	936.27	96	936.31	102
26	936.37	113	936.42	122	936.80	263	936.81	225	936.39	116	937.87	785	936.71	197	937.64	650	936.27	96	936.25	94	936.29	99	936.31	102
27	936.37	113	936.42	122	936.77	218	936.81	225	936.39	116	937.87	785	936.71	197	937.64	650	936.27	96	936.25	94	936.29	99	936.31	102
28	936.48	134	936.48	134	936.73	204	936.73	204	936.42	122	937.89	800	936.73	204	936.79	225	936.25	94	936.25	94	936.27	96	936.31	102
29	936.50	138	936.44	126	936.73	204	936.60	164	936.42	122	937.89	800	936.73	204	936.79	225	936.25	94	936.25	94	936.27	96	936.31	102
30	936.52	143	936.46	130	936.73	204	936.58	159	936.42	122	937.83	765	936.75	211	936.81	225	936.25	94	936.25	94	936.27	96	936.31	102
31	936.54	148	936.46	130	936.67	185	936.56	154	936.42	122	937.33	474	936.77	218	936.64	176	936.23	92	936.10	77	936.29	99	936.33	105
											937.17	393	.....	.....	926.62	170	.....	.....	936.10	77	936.08	75	.....	.....

**Monthly Discharge of Speed River at Hespeler for year ending
September 30th, 1919**

Drainage Area, 250 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
October .. (1918)	148	81	113	.59	.32	.45	.52
November "	170	105	137	.68	.42	.55	.62
December "	765	113	274	3.06	.45	1.10	1.27
January (1919)	263	109	163	1.05	.43	.65	.75
February	143	96	113	.57	.38	.45	.47
March	3,790	138	790	15.16	.55	3.16	3.64
April	1,150	185	419	4.60	.74	1.68	1.87
May	1,180	170	508	4.72	.68	2.03	2.34
June	138	92	109	.55	.37	.44	.49
July	94	63	82	.38	.25	.33	.38
August	130	70	95	.52	.28	.38	.44
September	105	81	97	.42	.32	.39	.43
The year	3,790	63	243	15.16	.25	.97	13.17

Table Showing Run-Off as Per Cent. Precipitation, 1918-19

River	Location	District	Precipitation Station	Inches		%
				Precip'n	Run-Off	
Black	Washago	Eastern Ont....	Gravenhurst ..	37.25	23.40	62.8
Bonnechere	Renfrew.....	"	Clontarf.....	33.90	16.29	48.1
			Pembroke.....			
Madawaska.....	Madawaska.....	"	Renfrew.....	33.50	14.93	44.6
			Madawaska ..			
Maganatawan, N..	Burk's Falls....	"	Algonquin Park	37.31	30.35	81.2
			Beatrice			
			Emsdale.....			
			Gravenhurst ..			
" S..	"	"	Ronville	37.31	22.50	60.4
			Algonquin Park			
			Beatrice			
			Emsdale.....			
Mississippi	Appleton	"	Gravenhurst ..	34.43	20.00	58.1
"	Ferguson's Falls	"	Ronville			
"	Galetta.....	"	Almonte	34.43	15.88	46.1
"	Snow Road	"	Almonte	38.08	22.94	60.2
Moir	Foxboro'.....	"	Westport	38.08	18.84	66.5
Muskoka, S.....	Black's Bridge..	"	Queensboro' ..	28.31	23.11	57.2
" N.....	Port Sydney	"	Beatrice	40.41	22.57	55.9
Napanee.....	Napanee.....	"	"	40.41	23.59	61.9
Petawawa.....	Petawawa	"	Westport	38.08	23.59	61.9
Tay	Glen Tay.....	"	Pembroke	36.26	18.35	50.6
York	Bancroft	"	Stonecliffe			
aux Sables.....	Massey.....	Northern Ont..	Westport	38.08	21.36	56.1
Blanche	Englehart	"	Madawaska	33.50	20.50	61.2
Frederickhouse...	Frederickhouse ..	"	Turbine	34.96	20.54	58.8
Kapuskasing.....	Kapuskasing.....	"	Whitefish.....			
Mississagi	Iron Bridge.....	"	Haileybury	36.26	24.79	68.4
South	Powassan	"	Timmins	34.23	23.00	67.2
Spanish	Webbwood	"	Kapuskasing ..	23.98	12.20	50.9
Sturgeon	Smoky Falls.....	"	Turbine	34.96	20.81	59.5
English	Ear Falls.....	"	Whitefish.....			
"	Manitou Falls ..	Northwest'n Ont.	Rutherglen....	30.29	20.40	67.3
"	Oak Falls	"	Turbine	38.79	20.52	52.9
"	Pine Ridge.....	"	Sturgeon Falls..	28.70	22.42	78.0
Beaver	Kimberley	Southwest'n Ont.	Lac Seul.....	23.18	7.51	32.4
Credit	Cataract Jet....	"	"	23.18	7.26	31.3
Rocky Saugeen...	Markdale.....	"	"	23.18	7.18	31.0
Saugeen	Port Elgin.....	"	"	23.18	8.00	34.5
"	Walkerton	"	Eugenia	32.39	17.65	54.5
Sydenham	Owen Sound	"	Alton.....	31.96	9.91	31.0
Thames, Main....	Kilworth	"	Eugenia	32.39	17.44	53.8
" North....	Fanshawe	"	Mt. Forest	38.86	17.24	44.4
" South....	Ealing	"	Walkerton			
Grand	Belwood.....	Grand R. B'n....	Mt. Forest	36.32	16.90	46.5
"			Eugenia	29.74	16.37	55.0
"			Owen Sound			
"			Woodstock	35.49	12.94	36.5
"			London			
"			Stratford			
"			Stratford	36.68	11.99	32.7
"			Woodstock	29.74	11.67	39.2
"			Alton	31.96	15.07	47.2
"			Alton, Elora ..	31.78	13.15	41.4
"			Paris			
"			Kitchener	30.05	14.12	47.0
"			Elora			
"			" Kitchener ..	29.41	12.16	41.3
"			Alton, Elora..	31.00	13.17	42.5
"			Alton, Elora ..	31.78	12.76	40.2
"			Kitchener, Par's			
Speed	Hespeler	"	Elora	29.10	13.17	45.3
			Georgetown....			

Miscellaneous Measurements

River	Location	Date	Discharge in Sec-ft.
Bighead	Meaford	Nov. 15, 1918.....	79
"	"	Jan. 5, 1919.....	184 (a)
"	"	Feb. 3, 1919.....	148 (a)
"	"	Apr. 5, 1919.....	250
"	"	May 17, 1919.....	185
"	"	June 12, 1919.....	77
"	"	June 13, 1919.....	68
"	"	July 6, 1919.....	1.5
"	"	July 17, 1919.....	1.5
"	"	Aug. 28, 1919.....	1.9
"	"	Sep. 10, 1919.....	1.6
Black Creek.....	Traverston.....	July 3, 1919.....	18
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(a) Ice measurement.

NORTH-WESTERN ONTARIO DISTRICT
Summary of Discharge

Summary of discharge in second-foot per square mile for regular river stations in the North-Western Ontario District for which such data are available in this report

Station	Drainage Area Sq. miles	1918			1919									
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year.
English River at Ear Falls.....	11,700	.50	.54	.66	.63	.55	.43	.44	.48	.58	.63	.60	.61	.55
English River at Manitou Falls.....	14,600	.48	.53	.63	.60	.54	.42	.43	.47	.56	.60	.58	.59	.54
English River near Oak Falls.....	15,570	.47	.52	.63	.60	.52	.42	.42	.46	.55	.60	.57	.59	.53
English River at Pine Ridge, H. B. Co's, Post.....	.....	.56	.58	.67	.66	.58	.50	.44	.51	.61	.66	.64	.65	.59
Turtle River at Mountain Rapids	1,760	.54	.....	.....	.....	.....	.....	1.07	1.35	.61	2.04	1.10	.69	1.06
Wabigoon River near Quibell.....	2,400	.25	.....	.....	.....	.....	.....	.....	.94	.83	1.58	1.12	.79	.92

NORTHERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations in the Northern Ontario District for which such data are available in this report.

Station	Drainage Area Sq. miles	1918				1919								
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year.
aux Sables River at Massey	524	1.12	2.18	1.60	.93	.61	1.19	3.19	2.80	2.36	.69	.44	1.04	1.51
Blanche River near Englehart	430	2.69	1.76	.71	.53	.27	.24	5.21	6.60	1.05	.41	.33	2.06	1.83
Frederickhouse River at Frederickhouse	1,260	2.86	2.19	1.29	.72	.48	.40	1.83	5.16	2.15	.26	.41	2.52	1.69
Kapuskasing River at Kapuskasing	2,820	.92	1.32	.67	.36	.29	.25	1.54	2.84	1.07	.27	.27	.90	.90
Mississagi River at Iron Bridge	3,565	1.31	2.28	1.88	1.34	.66	.82	3.71	2.98	1.84	.69	.36	.48	1.53
South River near Powassan	294	1.77	1.89	1.51	.90	.57	2.22	3.74	3.00	1.26	.28	.43	.42	1.50
Spanish River near Webbwood	4,340	.95	2.01	1.63	.70	.54	1.05	3.82	3.87	.75	.59	.57	.63	1.51
Sturgeon River near Smoky Falls	2,570	1.35	1.67	1.01	.85	.90	1.05	3.00	4.10	2.74	1.09	.84	1.17	1.65

EASTERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations in Eastern Ontario District for which such data are available in this report

Station	Drainage Area Sq. miles	1918			1919									
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Year.
Black River near Washago	585	1.00	1.55	2.39	2.73	.82	3.56	4.01	2.48	1.39	.42	.16	.11	1.72
Bonnechere River at Renfrew.....	910	.47	1.05	1.07	1.21	.89	1.15	2.10	3.27	2.40	.34	.24	.25	1.20
Madawaska River at Madawaska	800	1.05	1.09	1.17	1.09	.60	.79	1.89	2.62	1.94	.44	.26	.20	1.10
Maganatawan River (North Branch) near Burk's Falls	107	2.72	2.57	2.44	1.49	.87	2.75	6.00	4.59	1.98	.38	.37	.61	2.24
Maganatawan River (South Branch) near Burk's Falls	257	1.63	1.95	1.58	1.44	1.13	1.47	4.04	3.11	1.80	.66	.59	.50	1.66
Mississippi River at Appleton.....	1,150	.62	.93	1.16	1.25	.81	1.61	3.64	3.67	2.60	.60	.39	.39	1.47
Mississippi River at Ferguson's Falls.....	1,042	.94	.96	1.28	1.23	.66	1.59	3.96	4.17	2.62	.58	.42	.35	1.54
Mississippi River at Galetta.....	1,456	.63	.85	.93	.78	.47	1.39	3.05	3.08	1.85	.41	.27	.27	1.17
Mississippi River near Snow Road.....	446	.66	.74	1.24	1.21	.71	1.90	3.87	4.80	2.98	.84	.73	.58	1.69
Moirs River near Foxboro'	1,038	.53	1.30	1.72	1.23	.48	2.65	3.41	3.42	1.35	.29	.12	.08	1.39
Muskoka River (South Branch) at Black's Bridge	668	1.35	1.95	1.65	1.76	1.22	1.54	3.65	2.99	2.31	1.15	.46	.41	1.70
Muskoka River (North Branch) near Port Sydney	560	1.62	1.64	2.08	1.54	1.09	2.09	4.52	2.94	1.06	.33	.38	.66	1.66
Napanee River near Napanee	300	1.00	1.82	1.93	1.50	.55	3.40	3.78	4.28	1.91	.37	.12	.11	1.74
Petawawa River near Petawawa	1,572	.76	1.16	1.20	1.00	.77	.75	2.48	3.11	2.56	1.40	.61	.41	1.35
Tay River near Glen Tay	204	1.00	1.15	1.28	1.24	1.02	1.88	2.11	3.09	2.33	1.45	1.28	1.01	1.57
York River near Bancroft.....	374	1.34	1.76	2.37	1.65	.99	.97	1.89	3.18	1.94	1.06	.49	.41	1.51

SOUTH-WESTERN ONTARIO DISTRICT

GRAND RIVER BASIN

Summary of Discharge

Summary of discharge in second feet per square mile for regular river stations on Grand River and tributaries for which such data are available in this report

Station	Drainage Area Sq. miles	1918				1919										
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Year		
Grand River at Belwood.....	280	.48	.84	2.17	1.11	.33	3.41	2.50	2.05	.22	.04	.03	.03	1.11		
Grand River at Brantford.....	2,000	.43	.63	1.58	.49	.33	3.26	1.85	1.95	.41	.19	.18	.20	.96		
Grand River near Conestogo.....	550	.54	.58	1.55	1.35	.26	3.82	2.04	1.79	.26	.05	.05	.05	1.04		
Grand River at Galt.....	1,360	.36	.50	1.42	.52	.32	3.67	1.69	1.65	.27	.08	.09	.10	.90		
Grand River at Glen Morris.....	1,390	.36	.64	1.54	.45	.26	3.94	1.92	1.75	.32	.11	.11	.12	.97		
Grand River at York.....	2,280	.39	.57	1.27	1.02	.48	2.98	1.46	2.09	.38	.20	.18	.17	.94		
Speed River at Hespeler.....	250	.45	.55	1.10	.65	.45	3.16	1.68	2.03	.44	.33	.38	.39	.97		

SOUTH-WESTERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations in South-Western Ontario District for which such data are available in this report

Station	Drainage Area Sq. miles	1918			1919								Year	
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.		Sept.
Beaver River near Kimberley.....	100	.87	.96	1.14	1.15	.98	2.24	2.25	2.30	1.22	.72	.85	.90	1.30
Credit River at Cataract Junction.....	85	.34	.34	.53	1.34	.24	2.80	.91	.96	.48	.26	.24	.22	.73
Rocky Saugeen River near Markdale.....	96	.67	.90	1.26	1.23	1.09	2.65	2.43	1.96	1.11	.78	.67	.60	1.28
Saugeen River near Port Elgin.....	1,565	.49	1.10	1.82	2.18	.91	3.91	1.92	1.60	.47	.29	.23	.25	1.27
Saugeen River near Walkerton.....	850	.53	1.07	1.94	1.19	.74	3.74	2.22	1.84	.58	.39	.34	.30	1.24
Sydenham River near Owen Sound.....	71	.34	.90	1.90	1.39	1.03	4.04	2.08	1.55	.46	.28	.23	.21	1.21
Thames River (Main Stream) at Kilworth.....	1,270	.20	.43	1.53	1.00	.66	2.97	1.85	2.21	.33	.07	.05	.08	.95
Thames River (North Branch) near Fanshawe.....	585	.05	.11	1.84	1.04	.62	1.92	2.08	2.07	.19	.94	.05	.04	.88
Thames River (South Branch) near Ealing.....	515	.25	.34	1.14	1.04	.62	2.34	1.75	2.10	.31	.13	.12	.15	.86

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